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A Hand Hygiene Education and Training Improvement Strategy in an Acute Hospital Setting.

Noreen Hynes

A Dissertation submitted in part fulfilment of the degree of MSc in Healthcare Management, Institute of Leadership, Royal College of Surgeons in Ireland

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Change Management Project Dissertation

MSc in Healthcare Management 2013-2015.

Assignment:

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A Hand Hygiene Education and Training Improvement Strategy in an Acute Hospital Setting.

MSc in Healthcare Management (2013-2015)

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Declaration Form

Declaration:

"I hereby certify that this material, which I now submit for assessment for the Change Management Project Dissertation Module on the *Masters of Science in Healthcare Management* is entirely my own work and has not been submitted as an exercise for assessment at this or any other University."

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ABSTRACT

The aim of this organisational development (O.D.) project was to improve Hand Hygiene education and training compliance in an acute Hospital setting and by extension, improve hand hygiene compliance. Hand Hygiene is identified as the single most important intervention in reducing the transmission of Healthcare Associated Infections (HCAIs).

In 2009, the World Health Organisation published comprehensive evidence-based guidelines on Hand Hygiene in healthcare, which introduced a standardised approach to Hand Hygiene practices; 'The Five Moments for Hand Hygiene'. These guidelines have been adopted by the acute hospital and are core to our education and training programme. The Health Service Executive (HSE) Change model was used to guide this O.D project.

Kirkpatrick's model was employed to evaluate the Hand Hygiene education and training. A pilot class completed a pre and post education, knowledge survey. It was found that 10% of attendees had not previously received hand hygiene education and training despite it being mandated. The post education assessments pointed to a modest improvement in knowledge. Pre training assessment responses showed that 17% of participants did not routinely use hand-rub. A second (knowledge and perception) survey was circulated to a stratified purposeful cohort (10%) of employees in order to assess the attitudes and perceptions of Healthcare Workers (HCWs) with regard to hand hygiene. It was found that 8% of staff had not received mandatory training and 6% did not routinely use alcohol-based hand-rub.

Results show that the education and training compliance rate at the start of the project in September 2014 was 73% and this had improved to 83% by April 2015, following the education programme .The hand hygiene compliance rate was unchanged. Continued re-enforcement of this quality and patient safety indicator will remain a key deliverable for each manager through 2015.

List of Abbreviations.

A :

Admin – Administration

ADoN – Assistant Director of Nursing

AGREE (Instrument) - The Appraisal of Guidelines for Research and Evaluation (Instrument)

AHP – Allied Healthcare Professional

B :

BDU – Bed Days Used

C:

CDC – Centres for Disease Control and Prevention (USA)

CEO – Chief Executive Officer

CINAHL - Cumulative Index of Nursing and Allied Health Literature

CNM – Clinical Nurse Manager

D:

Dept. – Department

DoHC – Department of Health and Children

DoN – Director of Nursing

F:

FFA – Force Field Analysis

H:

HCA – Healthcare Attendant

HCAI – Healthcare Associated Infection

HCW – Healthcare Worker

HICPAC – Healthcare Infection Control Practices Advisory Committee

HIQA – Health Information and Quality Authority

HPSC – Health Protection Surveillance Centre

HSE – Health Service Executive

I:

ICT – Information and Communication Technologies

IP&C – Infection Prevention and Control

K:

KPI – Key performance Indicator

M:

MEDLINE – Medical Literature Analysis and Retrieval System Online

MSDS – Material Safety Data Sheets

N:

NAO – National Audit Office (U.K.)

NCHD – Non Consultant Hospital Doctor

NHS – National Health Service (U.K.)

NICE – National Institute for Health and Clinical Excellence

O:

OD – Organisational Development

Q:

QIP – Quality Improvement Plan

R:

RCSI – Royal College of Surgeons in Ireland

S:

SARI - Strategy for the Control of Antimicrobial Resistance in Ireland

SMART – Specific, Measurable, Achievable, Relevant and Timely.

SMOG – Senior Management Operational Meeting

SWOT – Strengths, Weaknesses, Opportunities and Threats

T:

TPB – Theory of Planned Behaviour

U:

UK – United Kingdom

USA – United States of America

UV – Ultra Violet

W:

WHO – World Health Organisation

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''A Hand Hygiene Education and Training Improvement Strategy in an Acute Hospital setting".

Chapter 1: Introduction.

1.1 Introduction.

Healthcare Associated Infections (HCAIs) describe infections which are contracted by patients during a hospital stay or which develop among hospital staff. The impacts of HCAIs include prolonged hospital stays, disability, financial burden and fatalities (Pittet *et al.*, 1994; Lusardi, 2007; Mortell, 2012; Kilpatrick *et al.*, 2012; Aziz, 2013). Their surveillance and prevention must therefore be a priority for institutions committed to making healthcare safer (World Health Organisation (WHO), 2009a).

HCAIs are a worldwide problem with greater than 1.4 million people per year acquiring infections in hospitals (Pittet and Donaldson, 2006). In the USA, reports estimate that 4% -10% of patients contract a HCAI (Hidron *et al.*, 2008). It is estimated that HCAIs are responsible for 90,000 deaths in the USA per annum (Klevens *et al*., 2007) and that the healthcare sector spends $28 billion – $34 billion per year on treating HCAIs (Scott, 2009). European studies report HCAI rates of 4.6% - 9.3% (Smyth *et al.*, 2006; Fitzpatrick *et al*, 2008) while five million HCAIs are estimated to occur annually representing 25 million extra days in hospital and €13 billion – €24 billion of economic burden (WHO, 2009a). Specific to the U.K., HCAIs are estimated to cost the National Health Service (NHS) £1 billion annually (Inweregbu *et al*., 2005; National Audit Office (NAO), 2009; Durlach *et al.*, 2012). In Ireland, HCAI prevalence has been measured at 5.2% (Health Protection Surveillance Centre (HPSC), 2012). It is estimated that 25,000 patients contract a HCAI each year with an associated cost of €11.8 million (Health

Service Executive (HSE), 2011). While it is acknowledged that not all HCAIs are preventable, it is estimated that approximately 50% are preventable (Pittet *et al.,* 2000; WHO, 2009a).The aim of the project was to improve hand hygiene education and training systems.

1.2 Rationale for the proposed change.

The transmission of HCAIs has recently been to the forefront of public and professional concerns. The Strategy for the Control of Antimicrobial Resistance in Ireland (SARI) (HPSC, 2005) identifies hand hygiene as the most important factor in aiding the prevention of infection. Key recommendations in this strategy include the provision of education and training in hand hygiene techniques and the establishment of an infrastructure to ensure adherence to best practice. These concepts are further emphasised by the WHO (2009a) in their Multimodal Hand Hygiene Improvement Strategy. This strategy was endorsed for implementation by the HSE in September 2013.

From a personal perspective, the challenge to effect improvement in hand hygiene compliance rates is an appropriate choice based on my previous management experience. I have worked as a nurse/nurse manager in the areas of surgical/medical wards, operating theatre, endoscopy, infection control and nursing administration. This previous experience provides me with credibility through my expert power base. Furthermore, legitimate power can be employed in my new role as hospital services manager. The application of these power bases enhances my project leadership role as both power and leadership are intertwined in the common requirement to influence others (Robbins and Judge, 2012).

Trust in the change leader within the workplace is critical to the staff involved (Smollan, 2013). Organisational changes can alter the nature of professional relationships depending on the employee's view of the change, for example, whether they would view change as something positive or as a threat to their sense of organisational justice (Lewicki *et al.,* 2006). It is clear to me therefore, as the change agent, that I must call on my vast clinical and people management experience to engender commitment to this project given that there will be an increased level of oversight applied to the hospital.

1.3 Organisational Context.

The hospital in which I am employed provides secondary care services to a catchment population of approximately 220,000 people. The annual patient activity number is approximately 156,000 while the staff complement is 750 (all grades). The number of interactions between patients and staff is, therefore, large and from an organisational perspective, the risk of infection transmission is a continuous threat to the institution's organisational strategies. To date, the hospital has achieved its national hand hygiene audit targets, however, a review of internal systems highlighted potential vulnerabilities with regard to the hospital's ability to maintain these targets. One significant gap identified is the lack of an electronic hand hygiene training attendance database which inhibits the hospital's ability to target staff that requires training. However, the primary concern is the decrease in national hand hygiene audit results (HPSC, 2012).

1.4 Aim of the project.

The aim of this project was to improve hand hygiene education and training systems in a timely and continuous manner for all healthcare workers (HCWs) that interact with patients in order to effect better hand hygiene compliance. The aim was achieved by reviewing the current mechanisms within the hospital regarding the delivery of hand hygiene education and training and by soliciting feedback from staff that interact with patients via evaluation tools designed to ascertain whether changes to course content and delivery are required.

1.4.1 Objectives.

In this project the objectives align with the education and training components of the WHO Multimodal Hand Hygiene Improvement Strategy (WHO, 2009a). The SMART objectives are based on an approach to change management by ensuring a process with planned outcomes which are specific, measurable, achievable, relevant and timely (Williams, 2003). The above aim was achieved through the following objectives:

1. Identification of the barriers to effective implementation:
    a. Understand the barriers to hand hygiene compliance by undertaking a literature review (international perspective) for feedback to the implementation team by November 2014.
    b. Understand the barriers to hand hygiene compliance by devising and circulating surveys to a sample of relevant staff members (local perspective) by January 2015.

2. Determine the baseline of hand hygiene education and training compliance rates by September 2014.
3. Delivery of enhanced training and education materials:
    a. Update/edit and deliver enhanced training materials (based on the findings associated with Objective number 1a and 1b above) to those staff that interact with patients by December 2014. A pilot education and training session and evaluation survey for staff will be used to determine success in December 2014.
4. Conduct observational studies (November 2014- April 2015) in order to assess hand hygiene practices to determine whether enhanced training and educational materials have realised an improvement in compliance rates prior to the next national hand hygiene audits in May/June 2015.
5. Achieve 100% Hand Hygiene education and training for all who interact with patients by 30TH April 2015.

1.5 Role of the Student.

Given my clinical background, I was tasked by the hospital manager to define any shortcomings which might negatively impact on future HPSC national hand hygiene audits. This work included the identification of systems deficits and the implementation of appropriate education and training to mitigate against such deficits. In terms of my role in the project, I lead the implementing of the project and took ownership for its successful completion. As the project leader, I had primary responsibility for defining, planning and managing the implementation of the education and training strategy. A roadmap (see Appendix 7) was developed to assist in

attaining the aim through the stated objectives while taking consideration for current deficits and appropriate countermeasures. I was responsible for identifying key resources, providing the direction required and for implementing the project roadmap to successful conclusion.

1.6 Conclusion.

From an organisational perspective, the impacts of HCAIs can include prolonged hospital stays, higher costs and fatalities (Mortell, 2012; Kilpatrick *et al.*, 2012; Aziz, 2014). Compliance by healthcare professionals with recognised hand hygiene standards is of the utmost importance in the fight to minimise the spread of infection (Gould, 2010).

During this organisational development project, I sought to identify areas for improvement in order to enhance the hand hygiene education and training systems at my hospital. I initially assessed current systems and structures in order to understand the compliance rates of healthcare professionals within the hospital. I used feedback from HCWs to understand their perspectives relating to hand hygiene compliance and undertook a literature review to understand previous approaches to improving hand hygiene compliance. The overall expected organisational outcome was safer quality care through improved hand hygiene compliance as measured against national hand hygiene compliance targets.

In chapter two, I systematically review the relevant literature in the areas of hand hygiene, compliance, education, attitudes and barriers. Chapter three describes the implementation of the change using the HSE Change Model (HSE, 2008). The methodologies applied to implement the project are discussed. Chapter four describes the evaluation of the interventions. Here, I discuss and critically analyse the outcomes of the project. In chapter five I compare outcomes to the aim and objectives of the project and to the critical success criteria as defined by the project management team. Strengths and weaknesses in the approach are identified and conclusions are made as to the success or failure of the project and as to the lessons that can be learned for future work in this area.

Chapter 2: Literature Review.

2.1 Introduction.

To achieve the aim and objectives of this project, I undertook a literature review to understand the methods used by others to effect improved hand hygiene education and training and compliance. Barriers to implementation were also identified such that lessons learned can be applied to my own project. Much literature exists which supports the theory that the application of good hand hygiene practices prevents the spread of HCAIs (Health Information and Quality Authority (HIQA), 2009; WHO, 2009a; Gould, 2010; Wyeth, 2013; Aziz, 2014). It has been demonstrated that HCAIs present a direct risk to patients, staff and the public and that they increase the financial burden on healthcare providers (HIQA, 2009; NAO, 2009). In response to these risks, evidence-based multimodal strategies have been developed to counteract the spread of such infections (WHO, 2009a). In this chapter, I outline the approach taken to the supporting literature review by describing the search strategy, by critiquing the associated literature, by presenting evidence to support the rationale for the change and by summarising the findings. Finally, I outline how literature review findings are applied to my proposed change.

2.2 Methodology.

In order to develop a systematic approach to the review, a number of computerised literature searches were conducted using the Royal College of Surgeons in Ireland (RCSI) on-line library resources. I found that some healthcare databases were relatively more informative than others

and therefore used “MEDLINE”, “CINAHL” and “Health Business Elite” databases and the Cochrane Library for the final literature search. In order to target relevant material, the final search criteria included the keywords “hand hygiene”, “training”, and “education”. Inclusion and exclusion criteria were applied including “English language only” and “full text availability”. The search was limited to material published from 2009 onwards. The final literature search criteria yielded a total thirty-three documents. Twenty-four of these documents were full academic articles and only these articles were used as primary material. These articles were reviewed and their summary findings are contained in Appendix 1. Some of the articles reviewed yielded secondary reading material, most notably from leading authors and recognised experts in this field, such as Pittet and Whitby. This secondary reading material is also documented in the reference list. In addition, the “grey literature” of relevance to this topic (e.g., HSE, 2008; HIQA, 2009; WHO, 2009a) was also reviewed.

2.3 A brief history of Hand Hygiene.

Hand-washing with water and surfactant has been applied as a personal hygiene procedure for centuries, however, the link between a lack of hand-washing and the spread of disease has only been established in recent times. In the 19th century, Semmelweiss established that HCAIs were transmitted via the hands of HCWs when he observed mortality rates (7% and 16%) in two separate clinics (Biddle, 2009). He noted that clinicians often went from the autopsy room directly to these obstetric clinics. His hypothesis was that “cadaverous particles” were transmitted from the autopsy rooms via clinicians’ hands to the clinics causing puerperal fever. Following the implementation of hand-scrubbing using a chlorinated lime solution before patient

contact, the mortality rate fell to 3% (Mortell, 2012). The first national hand hygiene guidelines were published in the 1980s in the USA. In 1995 and 1996 the Centres for Disease Control and Prevention (CDC) and the Healthcare Infection Control Practices Advisory Committee (HICPAC) in the USA recommended that antiseptic agent be used to clean hands. More recently, in 2002, HICPAC issued guidelines defining alcohol based hand-rubbing as the standard for hand hygiene practices while in the USA hand-rub consumption is tracked as an institutional metric (Allegranzi *et al.*, 2014). The present WHO guidelines (WHO, 2009a) are based on this previous HICPAC document and represent the most extensive review of the evidence related to hand hygiene in the literature. These guidelines and the associated WHO Multimodal Hand Hygiene Improvement Strategy and Guide to Implementation Tool Kit (WHO, 2009b) are designed to offer a conceptual framework and practical tools for the application of recommendations in practice.

2.4 A review of themes in the literature.

Despite consistent acknowledgement of its importance in preventing HCAIs, poor compliance to hand hygiene practices remains a challenge (WHO, 2009a). The reasons that HCWs put forward for non-compliance are widely reported (Wyeth, 2013). These include lack of resources (De Wandel *et al.*, 2010; Mortell, 2012), lack of knowledge, lack of motivation, skin irritation, poor facilities and lack of time (Pittet *et al.*, 2000; Barret and Randle, 2008; Gould, 2010; Wyeth, 2013). In a review paper, Boyce (1999) concludes that HCWs do not follow hand hygiene guidelines due to a lack of education, lack of priority, insufficient time, inconvenient

facilities/resources, allergy to chemicals and lack of leadership. The underlying reasons for non-compliance are categorised and discussed in the following text.

2.4.1 Theme 1: Beliefs, Attitudes and Behaviours.

Any programme to improve hand hygiene compliance cannot rely solely on awareness but must also consider the barriers to altering a person's pre-existing hand hygiene behaviour. Behavioural beliefs are largely influenced by educational programmes and promotional material (Kampf *et al.,* 2009; WHO, 2009a) however, behavioural change is complex and multifaceted (Pittet *et al.,* 2000; Sax *et al.,* 2007; Ott and French, 2009; Eveillard *et al.,* 2011). It requires a combination of education, motivation and system changes (Ott and French, 2009; WHO, 2009a; De Wandel *et al.,* 2010; Maxfield and Dull, 2011, Chau *et al.,* 2011). By contrast, Barrow *et al.* (2008) defined behavioural change as a communications challenge. Interestingly, compliance rates in this study improved significantly only when a punitive element was added following the introduction of an information technology tool where staff could anonymously report violations of compliance standards.

A lack of knowledge with regard to hand hygiene has also been linked to non-compliance of HCWs (Tavolacci *et al.,* 2006). While the literature suggests that healthcare institutions do need to ensure that the correct education, training and resources are put in place (WHO, 2009a; Gould, 2010; De Wandel *et al.,* 2010) a significant challenge in changing the attitudes and behaviours of HCWs is also emphasised (Wyeth, 2013). Attitudes to hand hygiene and its practice are

established early in life and Whitby *et al.* (2007) conclude that the ongoing training and support of staff is necessary to change behaviour in order to deliver improvements.

Hand hygiene behaviour can differ among HCWs within the same institution. Such behaviour can be driven by a person's knowledge, motivation, perception (e.g. the threat of infection) and behavioural norms. However, personal individual behaviour can also be influenced when considered with regard to interpersonal, institutional, community or administrative factors (WHO, 2009a). Some authors (Whitby *et al.,* 2006; Erasmus *et al.,* 2009) sought to understand the motivational reasons as to why HCWs engage in hand hygiene practices. In separate studies by Whitby *et al.* (2006) and Erasmus *et al.* (2009) HCWs were more likely to comply with hand hygiene activities when they perceived a personal threat. Therefore, programmes aimed at modifying HCW behaviours should include the positive outcome of self-protection (Biddle, 2009).

In 2009, Maxfield and Dull (2011) sought to apply a unique change management model to improve compliance. Their motivation resulted from a colleague's observation of a lack of hand hygiene compliance while his mother was a patient in hospital. In the first instance they introduced three core behavioural changes outlined in Table 1 below:

Step	Action	Description
1	WIWO (Wash In, Wash Out).	Wash in and wash out each time staff enters or exits a patient's room.
2	Hold one another accountable for Hand Hygiene compliance.	Maxwell and Dull (2009) advocated 100% accountability for each staff member to comply with Hand Hygiene and also advocated 100% accountability of staff to ensure each other's compliance.
3	Say "Thank you".	This behavioural system change sought to encourage staff to remind one-another to comply with Hand Hygiene and then remember to thank your colleague for doing so.

Table 1: Maxfield and Dull's three core behavioural changes (Maxfield and Dull, 2011).

Maxfield and Dull (2011) also introduced their six sources of influence for behavioural change. This influencer model (see Figure 1) helped drive compliance rates of 93% within the first two months and 95% at end of year one.

THE SIX SOURCES OF INFLUENCE		
	MOTIVATION	ABILITY
PERSONAL	Personal Motivation	Personal Ability
SOCIAL	Social Motivation	Social Ability
STRUCTURAL	Structural Motivation	Structural Ability

STEP	ACTION
1	WIWO
2	ACCOUNTABILITY
3	SAY THANKS

RESULT
X% COMPLIANCE

Figure 1: The Maxfield and Dull Influencer Model (Maxfield and Dull, 2011).

Eveillard *et al.* (2011) embarked on a multifaceted training intervention in order to improve hand hygiene practices. This intervention involved auditing, feedback from staff and education sessions which included scenarios from the workplace. This approach resulted in better staff engagement and positive effects were still evident one year later. However Eveillard *et al.* (2011)

concluded that further intervention was still required to improve practices. He planned to engage experts in the behavioural sciences to address remaining weaknesses.

A lack of compliance is considered to be a preventable behaviour (Erasmus *et al.,* 2009). Various social cognitive models such as the Theory of Planned Behaviour (TPB) have been applied to effect behavioural change in compliance (Whitby *et al.,* 2007). Understanding HCWs' motivations to perform hand hygiene is essential in order to increase hand hygiene compliance (Pittet *et al.,* 2004). The TPB has been used as a model to identify HCWs' intentions to comply with guidelines (Whitby *et al.,* 2006; Nicol *et al.,* 2009). The HCW's intentions to perform hand hygiene is purported to be directly predicted by three independent variables (Alemagno *et al.,* 2010);

(1) *Attitude toward the behaviour/ Behavioural beliefs*: If the HCW believes that performing hand hygiene will decrease HCAIs or protect him/her from HCAIs, then a positive attitude toward hand hygiene will result (Erasmus *et al.,* 2009). Supporting studies have demonstrated that HCWs initially preform hand hygiene to self-protect (Whitby *et al.,* 2006, Jang *et al.,* 2010). The education and training of hand hygiene practices is therefore crucial to effecting this behavioural change (Tavolacci *et al.,* 2006; Pittet and Donaldson, 2006).

(2) *Subjective norm/ Normative beliefs*: If there is an expectation to adhere to good hand hygiene practices, this will influence positively on others (Sax *et al.,* 2007). Unfortunately, the literature highlights professional status as an indicator for hand hygiene compliance, whereby, for

example, doctors' perception for compliance is directly related to *their* perceived risk associated with cross-infection (Pittet *et al.,* 2000). Mortell (2012) found that nurses' compliance was higher (>85%) compared to doctors (<60%). In this study, nurses became the primary drivers, adopting an influential role to promote good hand hygiene practice. In the first year compliance was maintained at greater than 70%, however during the second year, doctors disengaged, resulting in a reduction in their compliance rate. Roberto *et al.* (2012) concur that doctors have the lowest compliance and categorises their professional stance as a risk factor which directly contradicts their Hippocratic Oath '*First, do no harm'* (Mortell, 2012).

(3) *Perceived behavioural control/ Control beliefs:* This relates to the HCW's perception of their ability to perform hand hygiene practices. HCWs may believe that there are external factors such as resources, busyness, and shortage of staff which result in sub-optimal hand hygiene compliance (Ott and French, 2009; WHO, 2009a; Gould, 2010; Wyeth, 2013).

2.4.2. Theme 2: Socialisation, Culture and Religion.

Topics such as socialisation, culture and religion have become more important considerations in recent years as Ireland has become more multicultural and as the HSE's employee diversity profile has expanded. Socialisation, as defined by the process of conforming to the norms of a particular group, is a key factor in understanding infection control behaviours (Lusardi, 2007). Hunt *et al.* (2005) finds that medical students over-estimate their own compliance by as much as 50% while 25% cite the lack of good role modeling as a reason for their own non-compliance. This suggests that students are influenced by the social aspects of their work environment including the actions of peers. Topics such as the use of alcohol under the auspices of hand hygiene can be of concern to certain religions and cultures. Some religions have precise rules for

hand-washing included in holy texts (Mortell, 2012) while some religions (Hinduism, Islam) prohibit the use of alcohol (WHO, 2009a). These beliefs may be an obstacle to the implementation of the WHO recommendations.

2.4.3. Theme 3: Knowledge, education and training.

In a report evaluating the impact of a campaign which included both informational and training programmes, training emerged as the factor with a stronger association to improved hand hygiene compliance (Dierssen-Sotos *et al.,* 2010). Further, Tavolacci *et al.* (2006) cite a lack of knowledge as a barrier to good hand hygiene compliance while Kampf *et al.* (2009) state that staff training with specific relevance to the clinical situation is effective. Studies on HCWs have shown that valid, research-based information and knowledge about hand hygiene do influence good practices (Eveillard *et al.,* 2011). An educational programme providing accurate and pertinent facts is therefore indispensable for success. It has also been demonstrated that the use of personal experience is a potential means to improving the power of existing training methods (Nicol *et al.,* 2009).

The WHO Multimodal Hand Hygiene Improvement Strategy has been proposed to translate recommendations relating to hand hygiene into practice (Aziz, 2013). Included in the strategy is an education and training component covering the concept of repeated training on the importance of hand hygiene and the correct procedures for hand-rubbing and hand-washing. The "Five Moments for Hand Hygiene" concept (Appendix 2) outlined by the WHO (2009b) highlights the fundamental moments during which hand hygiene is essential in order to prevent the

transmission of pathogenic micro-organisms. This concept has been documented by the WHO with a view to providing clear guidance with regard to hand hygiene opportunities and thereby reducing variations in practice as well as providing a framework for education in this field. However, it is important to understand that compliance among HCWs can be low when guidelines are simply disseminated through an institution without context or consideration for local barriers and needs and without the opportunity for the HCW to ask questions or seek clarification (Barrett and Randle, 2008).

2.4.4 Theme 4: Methods to enhance Hand Hygiene compliance.

The literature describes a number of barriers to hand hygiene compliance. These barriers can be summarised under the following headings: (1) Lack of knowledge, skills, training and understanding, (2) Lack of resources due to availability or the built environment and (3) ambiguous documentation (Barrett and Randle, 2008; Mortell, 2012; Kilpatrick *et al.*, 2012). It seems intuitive to me that resources and ambiguity are factors that can be addressed with comparative ease or at least these factors are, to a large extent, within the control of the institution. Simple interventions such as “just in time” delivery of hand-rub products, easy access to sinks and soaps, signage, reviewing and updating of pre-existing documentation (policies, procedures and guidelines) should aid compliance. However, the challenge to address the knowledge gap is far more significant.

The WHO documentation advocates a multifaceted approach to improving hand hygiene compliance including, education and training followed by auditing and feedback with a

continuous improvement element including visual reminders, role-modelling and positive re-enforcement. Gould (2010) suggests that HCWs cannot ignore the fact that a lot of work has been done to address these issues including work on alcohol based products and the development of the WHO hand hygiene improvement strategy.

2.4.5 Theme 5: Role – Modeling.

Sax *et al.* (2007) suggests that hand hygiene compliance rates are influenced by peer actions and peer pressure. For example, Pittet *et al.* (2004) found that hand hygiene compliance among HCWs improved when senior staff were observed as being compliant (subjective norms/ normative beliefs). Consequently role models have been viewed as a factor effecting compliance whether it is negative or positive (Jenner *et al.*, 2006; Wyeth, 2013).

In attempting to understand the influence of role-modeling on compliance, a number of studies have been carried out in teaching/training institutions. Lankford *et al.* (2003) concluded that medical students were less likely to comply with hand hygiene if a peer or superior was seen as a non-compliant, emphasising the power of social influence in this regard. Lusardi (2007) argues that the attitudes and normative beliefs of staff greatly influence nursing students' development. In their report, Barrett and Randle (2008) found that student nurses also perceived other HCWs as being the influencing factor for hand hygiene compliance as a result of the perception that they should conform to the behaviours of other, more experienced staff members.

I have therefore concluded from previous literature that HCWs emphasise the importance of fitting into the clinical area and that conformance with role models shapes hand hygiene

compliance. To be accepted as part of a team, less experienced and newly employed staff often adopt the behaviours and attitudes of their mentors and other HCWs (Barrett and Randle, 2008). It would be advantageous therefore to gain the support of local leaders and perceived role models when implementing a programme of change. Pittet *et al.* (2000) reported that doctors' perceptions of being role models to other HCWs had a positive influence on their own compliance. The Geneva Hand Hygiene Model (Pittet *et al.,* 2000) which demonstrated improved and sustained hand hygiene compliance showed that peer support from managers and clinicians was key to improved hand hygiene compliance among nursing grades.

2.4.6 Theme 6: Benchmarking, Auditing and Feedback.

Many authors advance the concept of benchmarking their data and findings against other sources of data, for example, comparison between local data and data from other studies, comparison between local current data and local historical data (Oh *et al.,* 2012) and comparisons between separate but proximate groups in the same institution. Benchmarking is a useful tool in determining better performing areas in the institution and better mechanisms for influencing improved hand hygiene compliance. Practice audits (Benjamin, 2008) enable the identification of areas of practice which require improvement, which in turn inform the continuous improvement of training documentation (Wyeth, 2013).

Aziz (2014) states that evaluation and feedback should be included in improvement interventions by monitoring practice and that knowledge among HCWs should be measured. Two distinct types of feedback are described in the literature. Firstly, some authors solicit feedback from staff

prior to auditing or prior to educational and training interventions in order to determine self-assessed compliance rates through staff perception surveys. The WHO (2009b, p.26) provides examples of such surveys. This approach has the benefit of reducing the workload for auditors however, findings have shown that self-assessment scores can be excessively high when compared to scores noted following direct observation. Secondly, the use of direct observational auditing is advocated as the gold standard to both monitor compliance and enhance hand hygiene practices (WHO, 2006).

Feedback can be a constructive factor in energising and challenging institutions to perform to expectations. However, it can also be a destructive tool depending on the audience. The identification of underperforming units or of non-compliant individuals can attract negativity and disengagement. Tibballs (1996) identified that provision of feedback attributed to a six fold increase in hand hygiene compliance which was sustained over time. By contrast, in some cases, interventions on hand hygiene compliance which have included feedback on ratings have had limited success (Creedon, 2008). Techniques such as auditing and communication of compliance rates have limitations and can have differing impacts on the culture of hand hygiene compliance. Ensuring that staff are involved in and consulted on the audit process helps them to remain motivated which can enhance engagement (Aziz, 2013). According to Haessler (2014), hand hygiene rates increased by a factor of three when auditors were visible to HCWs at an institute in Canada. This study examined the Hawthorne Effect (observation improves the behaviour of those who are observed). However the Hawthorne Effect is debated throughout the literature (*Chau et al.,* 2011; Randle *et al.,* 2012). Sax *et al.* (2007) argues that bias cannot be avoided contending that while initially the Hawthorne Effect may cause HCWs to perform better hand

hygiene practices, the HCW will ultimately adapt to their presence. Whitby *et al*. (2007) disagrees and supports the validity of the Hawthorne Effect while Srigley *et al,* 2014 found a threefold improvement in compliance in the presence of auditors.

The WHO recommends that the gold standard of monitoring adherence to hand hygiene policy is through direct observation auditing of the "Five Moments for Hand Hygiene" (WHO, 2009b). This standard, however, has limitations. It is possible that direct observation could lead to observer bias depending on the relationship between the HCW and the observer. Valid and reliable data leading to accurate findings are paramount in the effort to improve hand hygiene compliance rates and more informed policies, procedures and guidelines. Audits also provide HCWs with feedback which is critical in the effort to address specific personal behaviour which compromises compliance (Gould, 2010).

In June 2011, the HSE and the Health Protection Surveillance Centre (HPSC) instructed that acute hospitals in Ireland perform bi-annual hand hygiene auditing as per the national protocol which is in turn based on the WHO "Five Moments for Hand Hygiene" protocol (WHO 2009b). The results of these audits are published on the HPSC website (HPSC, 2012) and subsequently in the national media. Hospitals which do not meet the national compliance target rates are required to put an action plan in place to address the deficit. The standard action plan template emphasises the need for additional education and training and re-auditing until the target is achieved. Thus the education and training component is considered to be of paramount importance in achieving good hand hygiene practices and compliance (Aiello *et al.,* 2008).

2.4.7 Theme 7: Multimodal hand hygiene interventions are more effective.

The numerous and varied reasons for non-compliance outlined above would suggest therefore that a multimodal approach is required to advance better compliance rates. Eveillard *et al.* (2011) employed a multifaceted training intervention which was undertaken to advance hand hygiene compliance. Practical training was rolled out including a "glow box" application. (A "glow box" or "hand inspection cabinet" shines a UV light onto hands which are washed with fluorescent solution to identify poor hand-wash technique (Clayton, 2014). Educational sessions were rolled out where real life scenarios were played out and debated. The sessions were delivered by local experts and personal experiences were discussed. Posters and leaflets were distributed throughout the institution. This work delivered significant and sustained improvement in hand hygiene compliance.

Pittet *et al.* (2000) reported the experience of the Geneva University hospitals with the implementation of a strategy based on several essential components and not only the introduction of an alcohol based hand-rub. The study showed a significant and long lasting improvement in hand hygiene compliance and in HCAI reduction. Given such results and its solid evidence base, the model was adopted by the "First Global Patient Safety Challenge" (Who, 2006) to develop the WHO hand hygiene improvement strategy.

2.5 Conclusion.

While many factors contribute to the development of HCAIs, the performance of consistent hand hygiene by HCWs has been shown to be the single most effective strategy to prevent the transmission of HCAIs (Pittet *et al.,* 2006; Sax *et al.,* 2007). However the multifactorial barriers which mitigate against compliance (Chau *et al.,* 2011) require a multimodal education and training intervention. Based on the findings from the literature review a number of interventions were agreed with the implementation team and collated into a monthly themed hand hygiene initiative (See table 6). These interventions include the revision of existing documentation, revision of education and training material to include, for example, the use of a glow box and Material Safety Data Sheets (MSDSs), revised signage, relocation of resources (hand-rub stations), updated promotional materials, identification and training of role-models in the medical and nursing teams, the sharing of benchmarking data, the use of direct observational audits, the sharing of staff feedback from surveys and the use of positive re-enforcement.

Following their assessment of the literature review and with support from the IP&C team, the implementation team agreed that the hand hygiene training and educational material should be updated to address the barriers identified in the literature review. It was agreed that the IP&C team would update the materials and that, therefore Objective 1a of the project (understand the barriers to hand hygiene compliance by undertaking a literature review (international perspective) for feedback to the implementation team) had been successfully achieved.

Chapter 3. Methodology and Methods:

3.1 Introduction.

In chapter three, an overview of the methodology and the supporting organisational tools I applied to deliver this organisational development (O.D.) project are presented. In order to guide the direction and management of the project, previously studied O.D. models are evaluated as to their suitability to this particular project and one such model is selected. Project management and leadership tools are discussed and key principles are used to inform the O.D. model selection criteria.

3.2 Approaches to Organisational Development.

Cummings and Worley (2009, p.1) defined organisational development (O.D.) as a "systematic application and transfer of behavioural science knowledge to planned development, improvement and reinforcement of the strategies, structures and processes that lead to organisational effectiveness". Senior and Swailes (2010) further developed this definition to include the elements of action research and continuous change leading to continuous improvement. A consistent theme in the O.D. literature is the need for *structured* and systematic planning and implementation. Commentators such as Kotter (1995) argue that any change must be managed carefully and that the use of a defined change model enhances the possibility of success while Kelly (2011), states that quality management in healthcare requires a systematic approach to ensure the delivery of an effective, efficient and economical service.

Another theme identified in the O.D. literature is the need to understand the *culture* of the organisation undergoing change (Carney, 2006; Kane-Urrabazo, 2006; Lucas, 2010). The culture of organisations and its effect on organisational performance and change management is readily acknowledged in the literature (Self and Schraeder, 2009; Carlstrom and Ekman, 2012). Historically, attempts to change cultures within healthcare settings have proven to be challenging (Brazil *et al.,* 2010) as culture influences an individual's beliefs as to what is important and what is appropriate (Caldwell *et al.,* 2009). Yet, the key to quality and safe healthcare delivery lies in the culture of the organisation (Department of Health and Children (DoHC), 2008).

In order to influence change upon the hand hygiene compliance rates within the organisation, I need, therefore to convince HCWs that correct hand hygiene compliance is indeed important and appropriate. Further, I need to consider the culture and attitudes amongst HCWs to this proposed change in order to identify and mitigate against barriers that might derail the change implementation plan. Indeed, further subcultures can exist in subdivisions of an organisation (Handy, 1999, CH.7, Glouberman and Mintzberg, 2001; Robbins and Judge, 2012, CH.16) making the implementation of change even more complex. While the existence of cultural barriers can add to the challenge of change, it should be noted that it is the culture of an organisation that will hold it together in the face of adversity through common identity, common purpose and at times, basic friendship (Goffee and Jones, 1996).

3.3 Rationale for the selection of an Organisational Development Model.

A number of change models exist. One example is Lewin's model which contains the three stages of unfreezing, moving and refreezing (HSE, 2008). However, this model is rigid and

suitable only to stable organisations (Burnes, 2004; Mitchell, 2013). Another example is Kotter's "eight stage change model" (Kotter, 1995) which emphasises urgency, vision and small incremental initial gains (Gill, 2011) but which is, again, more suited to stable organisations. Senior and Swailes (2010) (See Figure 2) developed a change model which includes action research and continuous improvement. The HSE has developed its own O.D. change model (HSE, 2008) (See Figure 3) in order to assist change agents in their project implementation roles by providing a structure for project implementation, planning and execution. Both of these latter, contemporary models are now evaluated.

The Senior and Swailes (2010) change model is a model which may be used in this organisational development project. To a large extent, it is based on the previous work by Cummings and Worley (2009). There are many similarities between this model and that of the HSE. For example, the need for data driven decisions is recommended from the outset so as to develop a compelling reason for the change and thereby garnering support from all stakeholders and avoiding waste of valuable resources. The language used in this model includes references to people, participation and collaboration. Structures that support continuous and sustained improvement are advanced and allow for adaptation during the change. However there are a number of differences between the two models that need to be evaluated before the selection of a change model for this project.

In the Senior and Swailes model (Senior and Swailes, 2010), use is made of the term "facilitator" as one who "facilitates" the change. From an external perspective, the connotations of this term may lead an observer to deduce that this person is more of a co-ordinator or promoter of change

rather than one who actions, leads and manages the change and who is ultimately responsible for the success or failure of the implementation plan. By comparison, the HSE change model (HSE, 2008) is very specific about one person leading the change and taking responsibility for the final outcome. Another difference between the models is that the Senior and Swailes model (Senior and Swailes, 2010), identifies barriers and potential risks at the second stage of the model ("Gaining Commitment"). However, the HSE model (HSE, 2008) includes a pre-planning section that allows the leader to explore and plan for potential barriers and to disposition those concerns well in advance of the formal interaction with target staff.

While the Senior and Swailes model (Senior and Swailes, 2010), does refer to confrontation, it is more related to different subgroups within the same organisation. By comparison, the HSE model deals with confrontation in broader terms, referring to and advising on, methods to ensure good working relationships with external groups (e.g., unions) as well as internal groups and internal group dynamics.

Senior and Swailes (2010) themselves, discuss at length the reasons as to why models similar to theirs may not succeed in the public sector. They refer to mechanistic reporting structures such as the public service, as being authoritative, lacking funding, having conflicting interests and being too unwieldy as to make decisions and enable organisational change. By comparison, the HSE change model (HSE, 2008) acknowledges the culture within the HSE, the need to work with external bodies and the possibility of resistance to change from within. Countermeasures or pre-planning actions are proposed to meet these challenges.

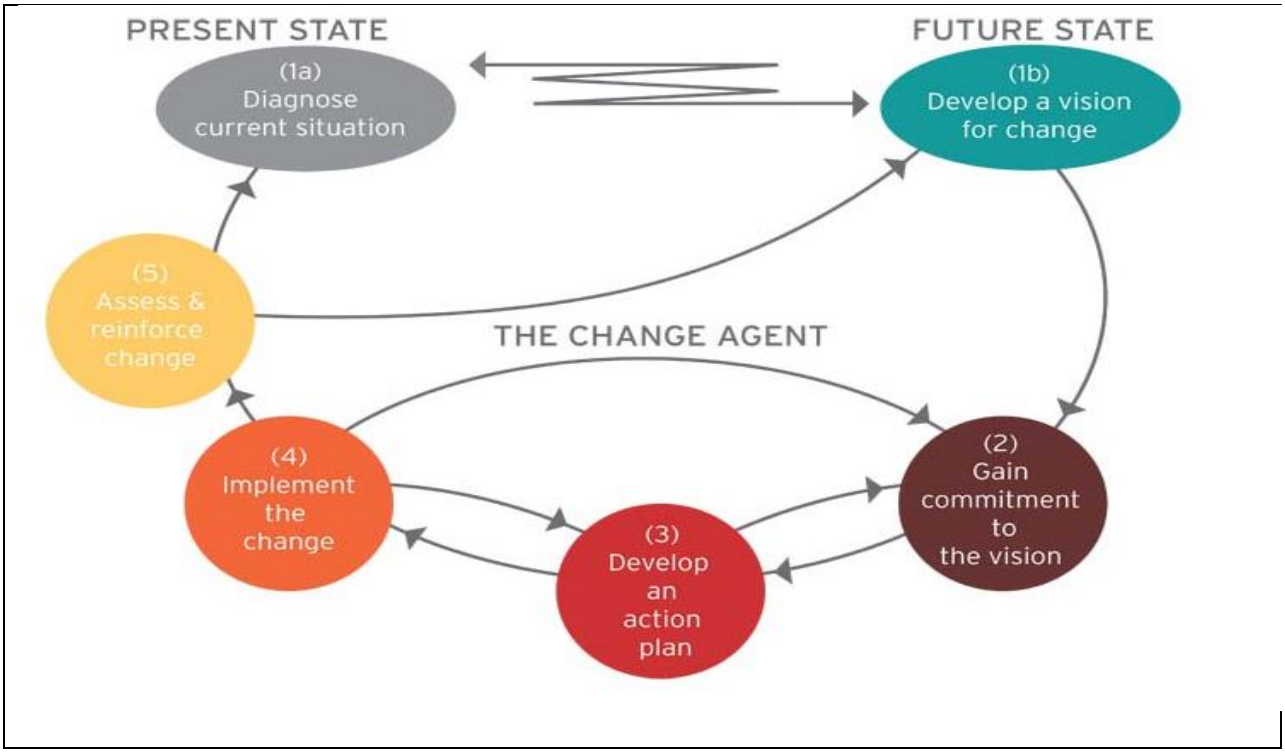

Figure 2: The Senior and Swailes Model (Senior and Swailes, 2010)

The HSE model (HSE, 2008) is specifically designed for organisational development in the Irish healthcare sector and is based on a comprehensive literature review of international best practice. The model emphasises that the roles of people at all levels in the organisation, as well project management, are critical to the successful implementation of proposed changes. In terms of "people" the model advocates an integrated approach between job functions to influence change. Language such as "active engagement, participation and partnership" is used to underline the need for people to be involved at all stages of the change. In terms of "project management", feedback, measurement and evaluation are identified as key enablers to add structure and

discipline to the change thereby enabling a sustainable change environment. Measurement and evaluation of service are also demanded of institutions in the National Service Plan (HSE, 2014). Measurement and evaluation are important factors in the model allowing the change agent to understand whether intermediate objectives are being met and if the desired outcome will be achieved by evaluating progress at points along the implementation path. This allows the change agent to re-direct the project if required. This ability to adapt plans and direction during the project is important in the context of a dynamic environment such as public sector healthcare.

The HSE model (HSE, 2008) further recognises that resistance to change should be expected. Concerns and considerations of the change agent should include culture, the personal concerns of staff, an attachment to the status quo, emotional baggage associated with previous, failed changes and staff/management/union relations (Appelbaum and Wohl, 2000). A compelling reason for using the HSE change model (HSE, 2008) is that the online support materials propose countermeasures to address these concerns and considerations so that support for the change is garnered from the outset through communication, identification of stakeholders and involvement of appropriate staff/decision makers and influencers throughout the lifetime of the project.

Arguably, the main advantage associated with the HSE Change model (HSE, 2008) is that it is easy to access on-line by all HCWs. The materials available are easily understood by HCWs in the Irish healthcare sector as they are already familiar with the language used. Described within, there are many associated tools available to the change agent (e.g., Strengths, Weaknesses, Opportunities and Threats (SWOT) Analysis and Force Field Analysis) which aid the agent in

his/her project implementation plan. A second advantage is that this model has been advocated as the model of choice by the HSE and has been employed by change agents in my hospital since 2009.

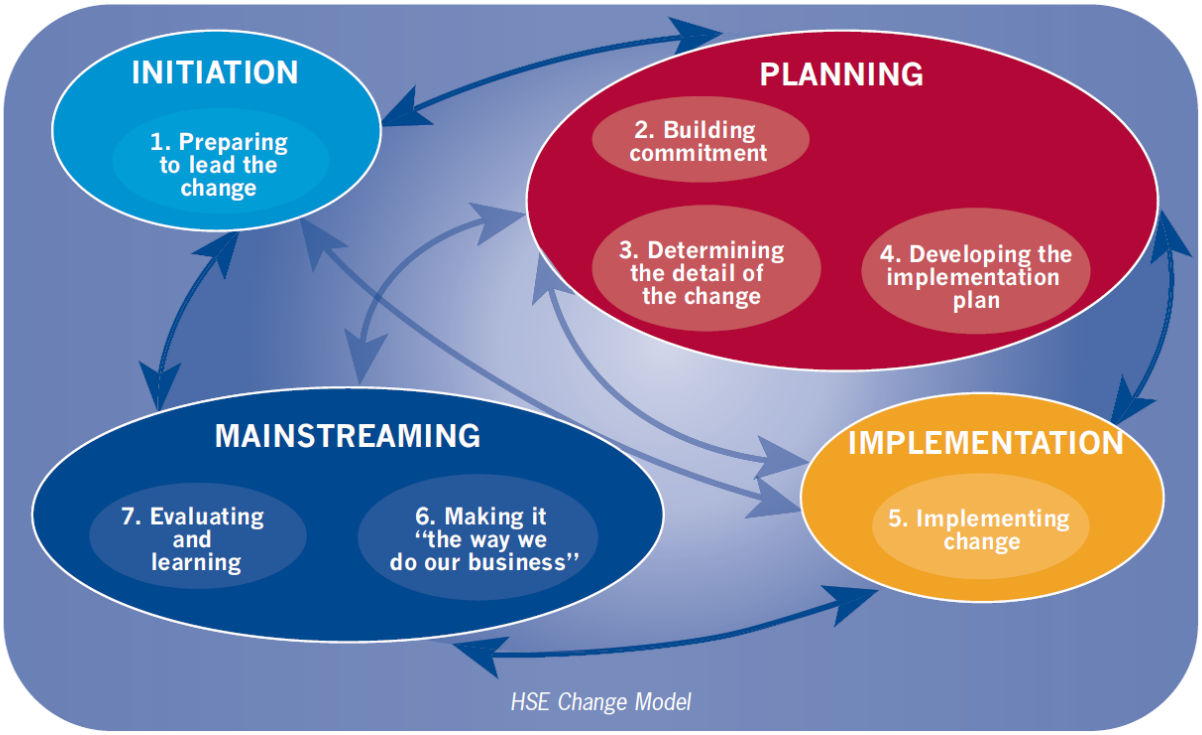

Figure 3: HSE change model (HSE, 2008).

3.4 Application of the HSE change model to the proposed change:

Change is a constant feature of the Irish healthcare sector (HSE, 2008). The HSE change model (HSE, 2008) was developed in order to inform change agents and to assist them in navigating their way through complex organisational change in a structured and disciplined manner to achieve the desired outcomes. With reference to Figure 3, it can be seen that this model describes

a journey from the initial current state to some desired future state while the organisation embraces a shared vision for change and improvement. The model also outlines four stages in the lifecycle of change implementation: Initiation, Planning, Implementation and Mainstreaming.

3.4.1: Initiation; preparing to lead the change.

The purpose of this phase of the model is to develop a case for the change informed by data, research and evaluation of the current status when compared to some desired status or organisational imperative such as legislation or directive. One advantage of applying a change model is that the model can identify the possibility that individuals affected by a proposed change are unaware that a problem exists or of a need for change (Young, 2009). The preparation phase includes the identification of key leverage points for success (strengths and opportunities) and the identification of barriers (weaknesses and threats) to the successful implementation of the project (see Table 5). Leadership and management roles are determined, followed by the need to engender support and commitment from the organisation as a whole. Finally, the key influencers in the process are identified, whether they are leaders, followers, stakeholders, advocates or sponsors. Time and effort invested in this phase has shown to contribute significantly to a successful outcome (HSE, 2008).

3.4.1.1: Developing a case for the proposed change.

Given the risk to patient safety and the level of costs incurred (Lusardi, 2007; Mortell, 2012; Kilpatrick *et al.,* 2012; Aziz, 2013) it is incumbent upon healthcare providers to ensure that HCAIs are prevented or controlled. The purpose of this project is to identify and critically discuss a quality initiative at my workplace which recognises the need for improvement with regard to the afore-mentioned HIQA standards and which is built on a foundation of practice development (education and training). Despite a change being sometimes imposed on leaders themselves from external forces, they must act on the change and lead the effort by prompting others to follow (Kavanagh and Askanasy, 2006).

3.4.1.2 Leadership, management and power:

In order to understand the internal and external influences that would come to bear upon this project/change, a stakeholder analysis was carried out. Defining a list of stakeholders and their relative levels of importance and influence assists me in defining how I should interact with them in order to bring the project to successful conclusion. The Stakeholder identification table (see Table 2) below was developed and qualified by "stakeholder type" and "location" where "type" is defined by either external or internal to the organisation and "location" is defined by proximity to the institution, whether that be local or remote. From this list of stakeholders, a stakeholder analysis (see Table 3) is carried out defining the stakeholders' level of importance and influence within the context of the proposed change.

Stakeholder		Stakeholder Type	Location	Comment
All HCWs		Internal	Local	All roles, all grades, all disciplines
All Patients		Internal	Local	The end user/customer
All Contractors		Internal	Local	Includes, for example, cleaning staff and agency HCWs
All Visitors		Internal and External	Local	Includes families/relatives
Our public		External	Remote	Potential patients in our catchment area
Irish Patients Association		External	Remote	Patient representatives
HSE		External	Remote	Senior healthcare management
HIQA		External	Remote	Quality Auditors
DoHC		External	Remote	Decision makers
Unions		Internal and External	Local and Remote	Staff representatives
Hospital Manager		Internal	Local	Decision maker/influencor
DoN		Internal	Local	Decision maker/influencor
Consultant microbiologist		Internal	Local	Decision maker/influencor
Clinical Director		Internal	Local	Decision maker/influencor
Quality and Risk Manager		Internal	Local	Supporter
Infection Control Staff		Internal	Local	Supporter
Household Manager		Internal	Local	Supporter
All Ward/Dept Managers		Internal	Local	Supporter
All Front office staff		Internal	Local	Supporter
All Back office staff		Internal	Local	Supporter
ICT		Internal	Local	Supporter
Finance Dept (Accountant)		Internal	Local	Supporter/gatekeeper

Table 2: Stakeholder identification table (HSE, 2008)

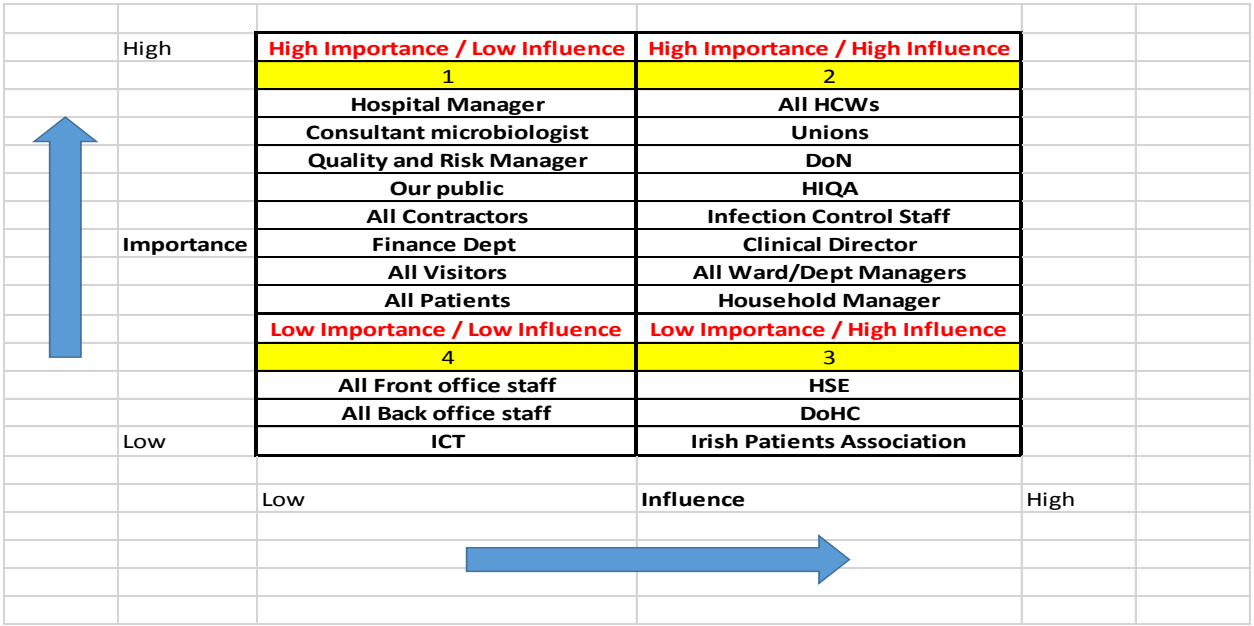

Table 3: Stakeholder Analysis Table (HSE, 2008).

This stakeholder analysis helped to clearly identify what staff were affected by this change as well as clearly identifying the interest and influence levels that they might apply with regard to the proposed change. This analysis also helped to identify which groups within the organisation would need to be represented on the project implementation team and indeed, which staff members would be good candidates for secondment to the team. The process also identified that a team sponsor would be required to deliver the correct level of influence in the organisation should the team require subsequent additional influence and power bases to break down barriers to implementation. Sponsors greatly influence the possibility of success by ensuring power, authority, support and resources are deployed in a timely manner (Borrill and West, 2001; Sirkin *et al.,* 2005). As a result, the hospital manager was approached and agreed to assuming the role of sponsor to the project implementation team.

Power:

The power that these stakeholders (bodies and individuals) exert would also be an important influencer on the on the success or failure of the change (Elias, 2008) and for that reason I sought to define their power bases using the French and Raven Power model (French and Raven, 1959) (see Table 4). Handy, (1999) outlines that power and influences are intrinsic components of any organisation. French and Raven's (1959) power taxonomy outlined five sources of power: coercive, reward, legitimate, expert and referent (Elias, 2008).

Sources of Power (from the French and Raven Model of Power)					
Power Base	**Coercive**	**Reward**	**Legitimate**	**Expert**	**Referent**
Power Tactic	Threat	Recognition	Position	Knowledge	Charisma
		Compensation			
Demonstrated by:	Government	All Managers	Government	Infection Control Dept	Nursing Managers
	Government Agencies		Government Agencies	Nursing Managers	Union Leaders
	HSE		HSE	Nurses	
	HIQA		HIQA	Organisational Development Dept	
			CEO	Consultant Microbiologist	
			Hospital Manager	Quality and Risk Manager	
			Nursing Managers	Finance Dept Manager	
			Household Managers	Front and back office staff	
			Clinical Director	ICT staff	
			Patient's Association		

Table 4: French and Raven Model of Power (Elias, 2008).

Leadership

It is recognised that the leadership, governance and management of the healthcare setting must seek to embed the positive and proactive culture of quality and patient safety with shared learning from near misses and incidents (HIQA, 2012; HSE, 2012; HSE, 2013). Many styles or theories regarding Leadership (traditional, transactional, transformational, servant, authentic, situational, ethical or soft) are described in the literature describing their traits and characteristics, however, regardless of the type of leader, leadership traditionally implies giving direction to followers (Sullivan and Decker, 2005) or the ability to influence followers to perform to their maximum (Gillespie and Mann, 2004; Northhouse, 2010).

Studies of leadership have provided theories such as “trait”, “behavioural”, “contingency” and “contemporary” to aid in the understanding of what defines a leader (Handy, 1999). Furthermore, researchers have found that developmental influences such as family and work experience have a significant influence on leadership styles (Arvey *et al.*, 2007; Murphy, 2012). This may be associated with the development of the “Big Five personality factors” (Neuroticism, Extraversion, Openness, Agreeableness and Conscientiousness) supporting the importance of traits as indicators of leaders (Singh and Pathardikar, 2010). The application of positive psychology strategies is also advocated for its successful organisational outcomes (Avolio *et al.*, 2009). However, transformational leadership remains the most advocated style of leadership with much research over the past three decades to support its effectiveness (Gillespie and Mann, 2004; Jabnoun and Rasasi, 2005).

The project implementation strategy was debated and agreed at the senior management operational meeting (SMOG) on 01.09.2014. It was agreed that this project was in alignment with the organisational goal of improving patient safety and that, therefore, the Hospital Quality and Patient Safety Committee would act as the steering committee. The Hospital Infection Control Committee and the Hygiene Services Committee membership were also identified as enablers for the implementation of the project. All committee chairpersons would ensure that this initiative was a standing agenda item for each meeting. Early participation of stakeholders was sought to create, agree and align on the case for the change. Prior to engaging staff, an analysis was undertaken to identify strengths, weaknesses, threats and opportunities (SWOT) with regard to the project (see Table 5). This analysis was used to identify and capitalise on organisational strengths while mitigating against or reducing weaknesses and threats while exploiting opportunities (Gill, 2011).

		Topic	Observation
Strengths	1	Staff expertise	The staff body has a great deal of knowledge, experience and expertise that can be leveraged to ensure successful implementation. Who has project management experience? Who is comfortable tabulating and analysing data?
	2	Staff commitment	The majority of staff will support the change as it is the right thing to do - seek out situational leaders and supporters of the change and ask if they will become mentors/advocates/trainers/role models.
	3	Senior management commitment	Senior management will most likely support the change as it is an organisational imperative, but who will be the sponsor?
	4	Administration support	We have Admin support on site - need to align one such person with the team to take admin duties from the rest of the team so that they can focus on implementation.
	5	Available literature/scientific evidence/Data	There is a wealth of literature that scientifically supports the change - key learnings should be taken from the literature and incorporated into the training and education materials.

		Topic	Observation
Strengths	6	Available tools (WHO and HSE)	The WHO and HSE documents are templates for successful implementation of the change to the hand hygiene approach in our hospital - no need to reinvent the wheel - use the templates and ensure that the implementation team understands them and is comfortable using them.
	7	Low cost	A cost benefit analysis does need to be carried out, however, it is expected that this change will be low on cost/cost neutral and high on benefit.
	8	Infrastructure	While the hierarchical nature of public healthcare institutions can be a disadvantage, in this case I can take advantage of the direct lines of report from the hospital manager down to every HCW. This will be useful for communications.
	9	Connections of the change agent	Power bases will be important and having worked as a nurse, CNMI, CNMII, CNMIII, ADoN and Senior Hospital Manager in the hospital, I will have my own connections and spheres of influence to ensure that work gets done and progress is maintained.

		Topic	Observation
Strengths	10	Infection control team	We have an Infection Control team on site - they need to be on the project team and will be able to assist in auditing and audit readiness. They will also be able to teach/assist HCWs throughout the organisation.
	11	Consultant microbiologist	We also have a microbiologist in the larger organisation, on site one day/week - he will be an advocate for the change.
	12	On line resources for HCWs to download	On line resources are available to all staff.

		Topic	Observation
Weaknesses	1	Staff morale	Morale may decline with HCWs who are already very busy - what if they react poorly to being asked to invest more time in hand hygiene /education and training compliance?
	2	Staff anxiety	There will be more auditing - what if the staff gets anxious about increased oversight?
	3	Hawthorne Effect	What about the provenance of our data - what if the Hawthorne Effect becomes a factor in our data (the concept that those who are being observed will behave appropriately only when they are being observed)?
	4	Needs high degree of time invested at the outset	Time is again the enemy - do HCWs really have the time to take out of their day to go to educational and training sessions, how can this be addressed?

		Topic	Observation
Weaknesses	5	Lack of hand hygiene knowledge	Some HCWs will have a lack of knowledge with regard to hand hygiene, despite being educated in the past. How can we ensure knowledge retention?
	6	Barriers to hand hygiene	Based on the literature review, there is the possibility that barriers exist to compliance throughout the hospital but are they known to all managers - these need to be identified and communicated.
	7	Consultant microbiologist is based in another hospital.	This advocate is remote from our location - how do we ensure engagement?
	8	Competing priorities	Competing priorities could inhibit execution.
	9	Time demands on personnel	Time demands on personnel could inhibit execution.
	10	Unscheduled care	Unplanned events could inhibit execution.
	11	Success to date	While we are meeting national targets today, this may engender complacency.

		Topic	Observation
Opportunities	1	Time	Time could be seen as an advantage in that we are meeting national targets at present and so we have time to prepare for future audits and future education and training.
	2	High Impact	We have an opportunity to implement a high impact change that should have a direct positive impact on our patients and our KPIs (Key Performance Indicators).
	3	Standardised training	With our approach, every HCW will get the same training from the same trainers and so we should be able to develop a standardised approach to hand hygiene procedures.
	4	Peer trainers	Trainers will come from within - we can identify trainers who will commit to this effort.
	5	Improved patient experiences	We have an opportunity to implement a high impact change that should have a direct positive impact on our patients and our KPIs (Key Performance Indicators).

		Topic	Observation
Threats	1	Time	While we are doing well in terms of national targets, HIQA auditors arrive unannounced and time may therefore, be a threat - we must not become complacent - we need to act now.
	2	Change process, too many	What other projects are on-going that have the support of the hospital management team - do we need to get prioritisation over other efforts?
	3	Lack of engagement from individuals	Some individuals may not support the effort - need to identify this group and convince them to follow. Educational material will help if delivered correctly.
	4	Lack of engagement from one group of HCWs	Some groups may not support the effort - need to identify these groups and convince them to follow. Educational material will help.
	5	Constant demand preventing staff attending training	Front line managers need to help in scheduling protected time for staff to attend training - a training schedule will help in this regard.
	6	Staff are 24 x 7 but training options will be 8 x 5	Need to evaluate how long it will take to train all staff if training is Mon-Fri (8am-5pm). We work in a 24 x 7 organisation - do sessions need to be run on nights/weekends?

Table 5: SWOT analysis (HSE, 2008)

The SWOT analysis was also used to populate a force field analysis (see Figure 4). This further enabled the change agent to identify the driving and restraining forces for the change (Senior and Swailes, 2010). In general it can be said that the driving and supporting forces were more compelling than the restraining forces and so it was possible to proceed with the change however the identification of the restraining forces at this early stage was important in addressing these potential barriers from the outset.

In devising the force field analysis (FFA) in Figure 4, each driver was assigned a score or weighting from 1-5, with 5 being the most forceful. As is evident from the analysis, all forces for this implementation of the education and training components of the WHO Hand Hygiene Improvement Strategy deemed it a necessary and vital initiative to assure hand hygiene compliance in the interest of patient safety. Those forces identified as resistors to the project align with the barriers to introduction of the project as outlined in the literature review.

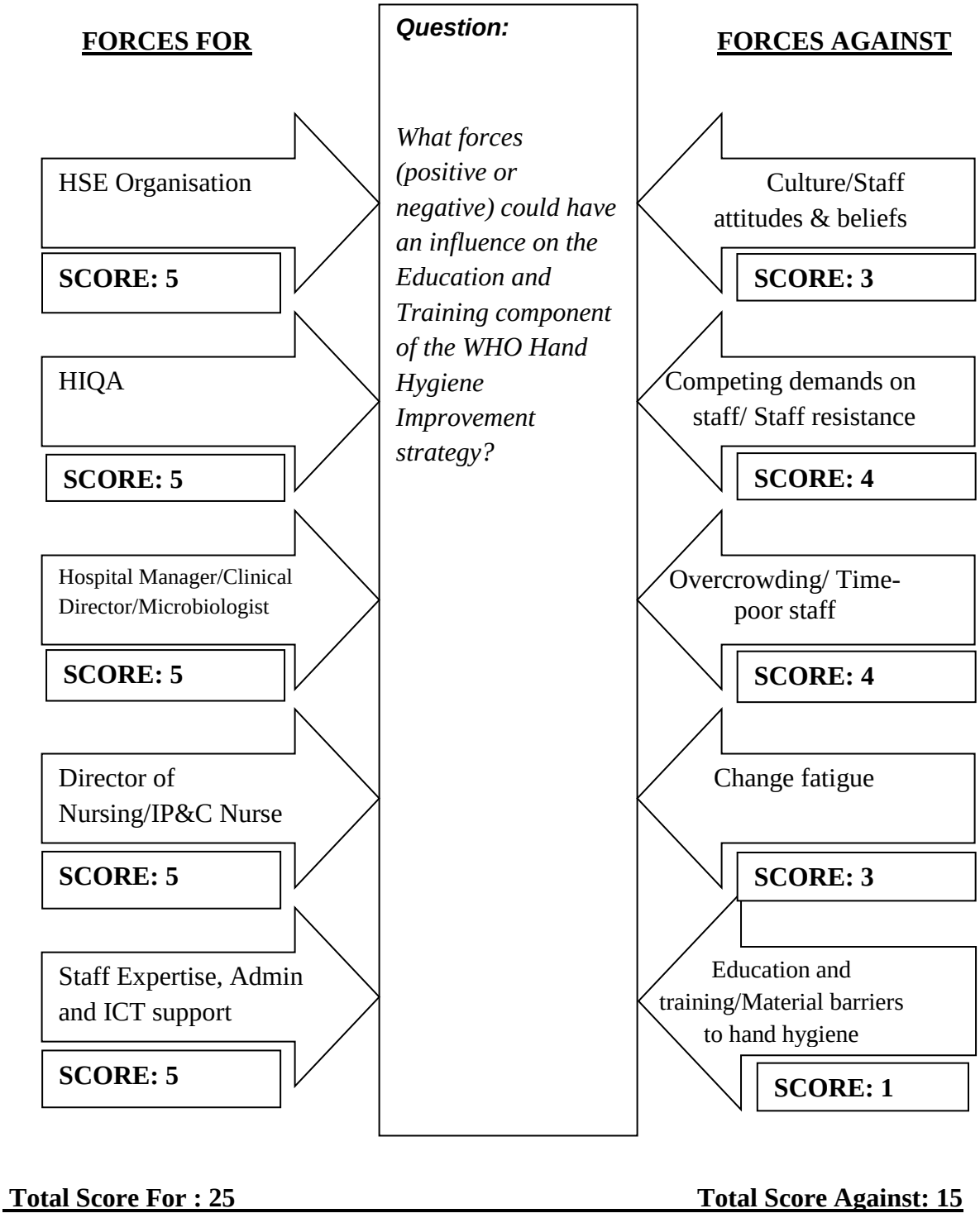

Figure 4: Force Field Analysis (Bozak, 2003).

3.4.2 Planning:

The purpose of the planning stage is to determine the specific detail of the change and to create support for the change process (HSE, 2008). Fernandez and Rainey (2006) refer to a requirement for leaders to communicate the need for change to staff and the reasons behind any proposed change. The appropriateness of the change needs to be communicated and accepted by staff for real change to occur (Holt *et al.*, 2003). It was obvious to staff that the proposed change was driven from external sources (HIQA, HSE) however there was an acknowledgement from some staff that the proposed change was needed while others displayed a level of apathy, citing that they were '*too busy' or 'that the hospital had not provided staff with the appropriate time to attend training'* (Hygiene Services Meeting 11/09/2014).

3.4.2.1 Building Commitment:

Transformational leaders energise and empower their followers to act by providing a vision for the future (Ozaralli, 2003). Gill, (2011) states that a vision should reflect the values of the person or organisation. As project leader, I gained agreement at the Hygiene Services meeting (11/09/2014) to drive a monthly awareness campaign to strengthen the hospital culture in relation to hand hygiene knowledge and compliance. This effort was referred to as the "Monthly Hand Hygiene Promotion Initiative" which is outlined below in Table 6:

Month	Hand Hygiene Promotion initiative
September 2014	• Replacing all hand hygiene posters throughout the hospital with different posters in individual wards. • Promotional hand hygiene t-shirts worn by seven different healthcare disciplines. • Dates and locations and trainers of hand hygiene training and education sessions were defined and communicated to all staff. • Promotion of HSEland E-learning for hand hygiene education & training. • Ward/department observational hand hygiene audit with feedback and targeted education (National Hand Hygiene Audit).
October 2014	• Glove use leaflet from WHO for circulation to all Wards/departments. • Practical Alcohol hand gel application demonstration & training of technique with glow box at ward level. • Ward/department observational hand hygiene audit with feedback and targeted education (National Hand Hygiene Audit)
December 2014	• Hand hygiene related patient tray liners delivered by the catering team. • Hand hygiene stickers worn by patients and staff. • Agar plating of staff hands:' *Take the opportunity to see what is growing on your hands before breakfast!!!* (Results displayed on Poster outside Staff Canteen)'

	Hand Hygiene Promotion initiative
December 2014	• Laminated WHO "Five Moments for Hand Hygiene" for all 16 hand hygiene champions to disseminate awareness among colleagues.
Month	**Hand Hygiene Promotion initiative**
January 2015	• Dates and locations and trainers of hand hygiene training and education sessions. • Promotion of HSEland E-learning for hand hygiene education & training. • Hand hygiene pre/post education & training questionnaires at monthly hand hygiene education session. • Glow box training on hand hygiene technique in the clinical areas. • Ward/department observational hand hygiene audit with feedback and targeted education (Local Hand Hygiene Audit).
February 2015	• Replacing all hand hygiene posters throughout the hospital with different posters in individual wards. • Laminated "Five Moments for Hand Hygiene" pocket-cards for staff members. • Promotion of barrier cream. • Ward/department observational hand hygiene audit with feedback and targeted education (Local Hand Hygiene Audit).

Month	Hand Hygiene Promotion initiative
March 2015	• A staff perception survey. • Locally trained hand hygiene auditors from different disciplines. • Ward/department observational hand hygiene audit with feedback and targeted education (Local Hand Hygiene Audit).
Month	**Hand Hygiene Promotion initiative**
April 2015	• Hospital wide audit of alcohol hand rub at point of care. • Ward/department observational hand hygiene audit with feedback and targeted education (Local Hand Hygiene Audit).
May 2015	• World Hand Hygiene Awareness Day May 19th 2015: Infection Prevention & Control Poster Presentation Feedback to all staff of findings from 1) Hand hygiene pre/post education & training questionnaires and 2) staff perception survey. • Promotional hand hygiene t-shirts worn by seven different healthcare disciplines. • Ward/department observational hand hygiene audit with feedback and targeted education (Local Hand Hygiene Audit).

Table 6: The hospital monthly awareness campaign**.**

3.4.2.2 Determining the detail of the change:

At this stage it was necessary to assess the current situation in order to determine the detail of the change and to outline what the organisation had already in place to support success (HSE, 2008). Although there was a degree of readiness on the part of the consultants and nurses for the change there was an element of reluctance due to the fact that it was seen as an increase in workload (Caldwell *et al.,* 2009). Research has shown that change is more likely to succeed if workload does not increase by greater than 10% (Sirkin *et al.,* 2005). The initial assessment involved a review of the IP&C education and training material. The material was updated to ensure that it was in accordance with the WHO guidelines and the concepts of the "Five Moments for Hand Hygiene" (WHO, 2009b). However, the IP&C nursing team now consisted of only 19.5hours/week due to an unexpected absence (September 2014) and was restricted in its ability to deliver training. The Consultant Microbiologist accepted governance for medical staff, while each department manager committed to monitoring and returning monthly hand hygiene education and training statistics.

Networking has been shown to assist in developing more complete, creative and unbiased views on issues (Timmins, 2008). Using networks it might be possible to imitate what has been implemented in other organisations and in smaller subgroups within my own organisation. The current IP&C nurse had joined the organisation recently and brought with her ideas from elsewhere. She advocated ownership for hand hygiene education and training attendance to each department/ward manager.

3.4.2.3 Developing an implementation plan:

The purpose of this stage is to undertake a detailed design of the organisational, service and cultural changes that are required to achieve this vision. Organisational culture has been shown to have a significant impact on the change process (Oakland and Tanner, 2007). Recognising the culture within an organisation can increase the likelihood of success (Burnes, 1996). Furthermore, Ford *et al.* (2008) state that the change agents must communicate regularly and enthusiastically and that which is communicated must be truthful, realistic, accurate and unbiased. An implementation plan was devised to guide the change process so that a clear outline of the project could be visualised by the team members. The IP&C nurse scheduled monthly education sessions and communicated via e-mail to all staff, however, department education was also facilitated with prior agreement between parties. All department managers were tasked with monthly monitoring and reporting of their staff attendance at hand hygiene education and training within the rolling 24 month period. This data was submitted to the General Services Manager (Project Lead).

3.4.3 Implementation:

Timmins (2008), warns that it is not always the change that is resisted but the manner in which that change is communicated and implemented. Undertaking change with people rather than to them, has greater chance of success (Higgs and Rowland, 2011). Leadership is important in setting the vision, values and sense of urgency with regard to the change but for it to be successful it has to be managed appropriately (Holt *et al.*, 2003). Front line managers, they stress, play an important role. Leeman *et al.* (2007) stress that the hierarchical nature of nursing

demonstrates the importance of the nurse manager role and indeed one can greatly benefit from their supervisory role when implementing change. Managers can ensure that the process is kept on track and at the same time identify any issues that might arise in the process (HSE, 2008) and for that reason monthly feedback with regard to the process and implementation plan was sought by the Project Lead.

As monthly data was submitted to the Project Lead it became evident that there was an issue. While some departments were addressing their staff educational requirements other departments returned statistics which were of cause for concern. Specifically, the Medical staff remained stagnant in their hand hygiene education and training requirements over a period of three months. A meeting was convened by the Project Lead with the Consultant Microbiologist to ascertain the reasons behind this performance. The Consultant Microbiologist had communicated with all his medical colleagues that this training was a mandatory requirement. However, due to the fact that the Consultant Microbiologist was not on site full time his ability to follow up with medical staff was reduced. It was agreed that I, the project leader, would liaise with the Clinical Director on site to address this deficit internally. The Consultant Microbiologist agreed with this measure. I convened a meeting with the Clinical Director who offered his commitment to drive forward the initiative.

Furthermore, within the auxiliary staff only one manager was retuning data on a monthly basis and another had not returned any data. I again sought a meeting to ascertain why this was so. It transpired that this manager had no attendance records of her staff at hand hygiene education as

she thought that the IP&C department kept these records and that IP&C were submitting the data to me. To address this deficiency I convened a meeting with the IP&C nurse. I sought to transfer hand hygiene training records from IP&C to this department. However, I was to meet another obstacle which I had not anticipated in advance. The IP&C department had undergone staff turnover in recent years. A business case submission was proposed to the HSE for a qualified IP&C nurse which was then sanctioned for the hospital. This nurse joined the hospital in the latter half of 2014. It transpired that as a result of this staff turn-over the electronic hand hygiene training attendance database had not been maintained. Again as the project lead I needed to address this issue. I allocated a competent staff member to update these training records. Another concern in this area was that Non-Consultant Hospital Doctors (NCHDs) rotate every six months. I needed to be assured that their training in particular was compliant. The Medical Manpower Manager was enlisted to verify these training records. It was highlighted that a review of the medical staff training compliance would be required for accuracy of detail every six months. The Medical Manpower Manager assumed oversight for this action.

3.4.4 Mainstreaming:

This stage focusses on integrating and sustaining the change into new ways of working and behaving (HSE, 2008). For change to be permanent it must become part of the organisation's culture or the "way we do business here" (HSE, 2008). Central to this vision is that this development/change was to be at the very core of the hospital Quality and Patient Safety KPI monitoring.

Higgs and Rowland (2011) tell us that if engagement and participation have been part of every stage then employees will have ownership of the change. This results in change with staff rather than change being directed at them and they are more prepared to accept that change and indeed become advocates for the change. A focus group discussion at a Hospital Heads of Service meeting on 18th September 2014, chaired by the Hospital Manager, asked for comments in relation to the target of 100% training compliance of staff. The department managers highlighted their concerns as follows (see Table 7):

'Hand hygiene education and training only monthly and at a fixed time of the day, this does not suit some departments'.
' Department training would suit my area as I could arrange targeted training for staff who need to attend this education at a date and time that I can arrange'.
'Difficult to release Ward staff for training due to workload and hospital's full escalation protocol in activation continuously due to Emergency department surge'.

Table 7: List of concerns relating to hand hygiene education and training

Focus groups are seen as a means of gathering views, opinions and beliefs on a particular subject from a number of participants in single sessions (Carney, 2006). It was agreed that each department manager would liaise with the Infection Prevention and Control Nurse to agree departmental scheduled training.

3.5 Conclusion:

This chapter traced the change process using the HSE change model (HSE, 2008) through its stages of Initiation, Planning, Implementation and Mainstreaming. The scientific support from the literature review and the concepts discussed in the OD literature are powerful drivers in helping to persuade those less convinced of the change in the initial stages. The HSE's model (HSE, 2008) with its clear focus on SWOT, stakeholder and force field analyses ensured stakeholder engagement throughout the project. Embedding the change in the organisation is the final stage of the process. The HSE model (HSE, 2008) finishes with an evaluation stage which is described in chapter 4.

Chapter 4: Evaluation.

4.1 Introduction:

Evaluation has been defined as a systematic and structured review of a service in order to determine whether outcomes provide value for money and whether it supports the intended objectives (HSE, 2008). Given the relatively recent increase in public and political expectation, healthcare organisations are required to evaluate all services to ensure that they deliver value for money and achieve desired objectives (DoHC, 2008). Lazenbatt (2002) advocates that evaluation should be applied in order to focus on effectiveness, efficiency and economy. This focus in turn influences practice, as knowledge can drive appropriate corrective measures (Mangram *et al.*, 1999) and drive safer patient outcomes (Gibbons *et al.*, 2011).

Evaluation is important in determining whether an intervention has succeeded and by extension, can aid in better planning for future interventions (Green and South, 2006). Evaluation is therefore an essential component of this O.D. project and in this chapter I outline the methods of evaluation employed. I also present findings in terms of data and information and assess the change relative to its aims and objectives as documented in chapter one using an evaluation tool appropriate to the subject matter.

4.2 Models/Methods of evaluation:

In 2011, the HSE published a National Protocol for Hand Hygiene compliance for the WHO "Five Moments for Hand Hygiene" (WHO, 2009b). The implementation of this protocol has resulted in improvements at a national level in hand hygiene compliance and the achievement of national targets (HSE, 2012). Given that education and training is the first measure in providing HCWs with the information they need to enhance hand hygiene compliance, this further lends to the rationale for the evaluation and measurement of hand hygiene training, i.e., that which is measured will have appropriate preventative measures applied to ensure success (Smyth *et al.*, 2006; Ward *et al.*, 2008; Wilson and Kiernan, 2012).

Parry *et al.* (2013) emphasise that evaluation methods need to provide an understanding of why an improvement initiative has or has not worked and how it can be improved in the future, consequently a number of evaluation models were reviewed. The Deming model (HSE, 2008) was discounted as it does not include an assessment of the more subjective inputs to project implementation such as attitudes and culture. The clinical audit tool (NICE, 2002) was considered as it underlines the need for data extraction and analysis. The Appraisal of Guidelines for Research and Evaluation (AGREE) instrument (Graham and Harrison, 2005) was reviewed but would require modification for this application. The Lewin model (Robbins and Judge, 2012) was rejected as it assumes that the organisation is in equilibrium (Mitchell, 2013). The evaluation component of the HSE change model (HSE, 2008) itself was reviewed. Kotter's model (Appelbaum *et al.*, 2012) was also reviewed and found to be less flexible, requiring completion of all eight steps in a finite timeframe (Cellars, 2007). Finally, Kirkpatrick's model (Kirkpatrick,

1994) was assessed. The main advantage of this mode and the reason for its selection is that it focusses specifically on education and training (Smidt *et al.,* 2009; Parry *et al.,* 2013).

4.3 Evaluation tools:

The Kirkpatrick model (1994) contains four sections; Reaction, Learning, Behaviour and Results (Parry *et al.,* 2013). "Reaction" refers to the participant's level of interest in the subject matter. Typical tools employed to evaluate "reaction" include a post education evaluation survey to gauge the participant's impressions of the training. "Learning" refers to an assessment as to whether the student has retained the critical information needed to execute their responsibilities. Typical tools employed to evaluate "learning" include pre and post education assessments and practical tests. "Behaviour" seeks to understand whether students have been empowered to use their new knowledge in their daily tasks. A typical tool used to assess whether there has been a change of behaviour is the direct observation audit method. An evaluation of "results" is the measurement of the impact of the training on key performance indicators (KPIs) which in this case includes (1) hand hygiene training compliance (100% of staff who interact with patients), (2) the hospital hand hygiene compliance rate (target > 90%) and (3) the use of alcohol based hand-rub (target: 25 litres per 1000 bed days used (BDUs)).

4.3.1 Reaction:

The December 2014 education and training session was a pilot class which was delivered using updated materials based on the findings and recommendations agreed with the infection control team following the literature review undertaken in the previous month. In assessing the HCWs' impressions of the new training materials, they were furnished with a post education evaluation survey (Appendix 3). Questions were asked as to whether participants found the training informative and whether they felt that they had gained a better understanding of the concepts underpinning hand hygiene compliance. A further, open-ended question was posed allowing the participants to suggest improvements to the delivery of hand hygiene education and training and to make comments or observations relating to hand hygiene compliance. A summary of the output of the post education evaluation survey (survey 1) is contained in Table 8 below:

Job role	Total hospital complement	December 2014 hand hygiene and education training evaluation sheets returned	returned evaluation sheets as a % of the hospital complement	% positive to informative	% positive to better understanding	Comments
Nurse/HCA	330	25	8%	100%	100%	Comments were positive to the materials and the tutor. Comments highlighted concerns with doctors and contract cleaning staff hand hygiene compliance.
Auxillary	129	12	9%	100%	92%	Comments were positive to the materials and the tutor. Comments related to requesting more information and more training.
Medical	85	5	6%	100%	100%	No comments documented
AHP	82	8	10%	100%	88%	Comments were positive to the materials and the tutor. Comments related to the incorporation of hand hygiene training into other infection control lectures. Comments related to concerns with doctors hand hygiene compliance.
Totals	626	50	8%			
Averages				100%	95%	

Table 8: Summary findings of the post education evaluation surveys delivered to participants in the pilot hand hygiene education and training session (December 2014).

The infection control committee reviewed the surveys and found that respondents were unanimously favourable towards the new information imparted in the class. The vast majority (95%) were also positively disposed to a better understanding of hand hygiene, having received this new information. Concerns were raised by some respondents as to the level of participation by medical staff and the committee agreed to validate the veracity of these comments. The committee also noted a suggestion that this (hand hygiene) training should be included in the generic infection control training seminars. In fact the committee had previously agreed that hand hygiene training should be delivered in a stand-alone fashion, separate from any other training, given its high level of importance. The committee concluded this decision had obviously not been communicated effectively; however it was also agreed by the committee following a review of the data from Table 8 that Objective 3 (Delivery of enhanced training and education materials) had been successfully achieved.

4.3.2 Learning:

A pre and post education and training knowledge assessment (Appendices 5 and 6) was delivered to participating staff at the January 2015 education and training session in order to assess whether the training in this session had delivered an increase in knowledge. Some open ended questions were also asked as part of the assessment including a question relating to the local barriers associated with compliance. The responses gathered and a comparison between the pre and post assessment responses is depicted in the figures 5-12 below:

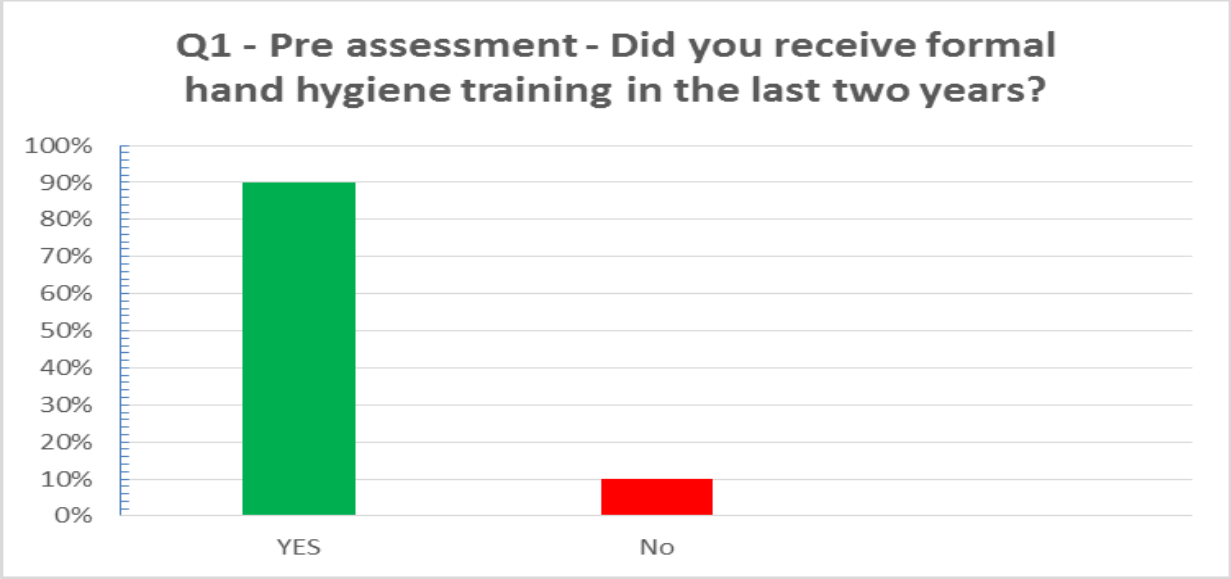

Figure 5 : Responses to Q1 in the pre education and training assessment (Did you receive formal training in hand hygiene in the last two years?)

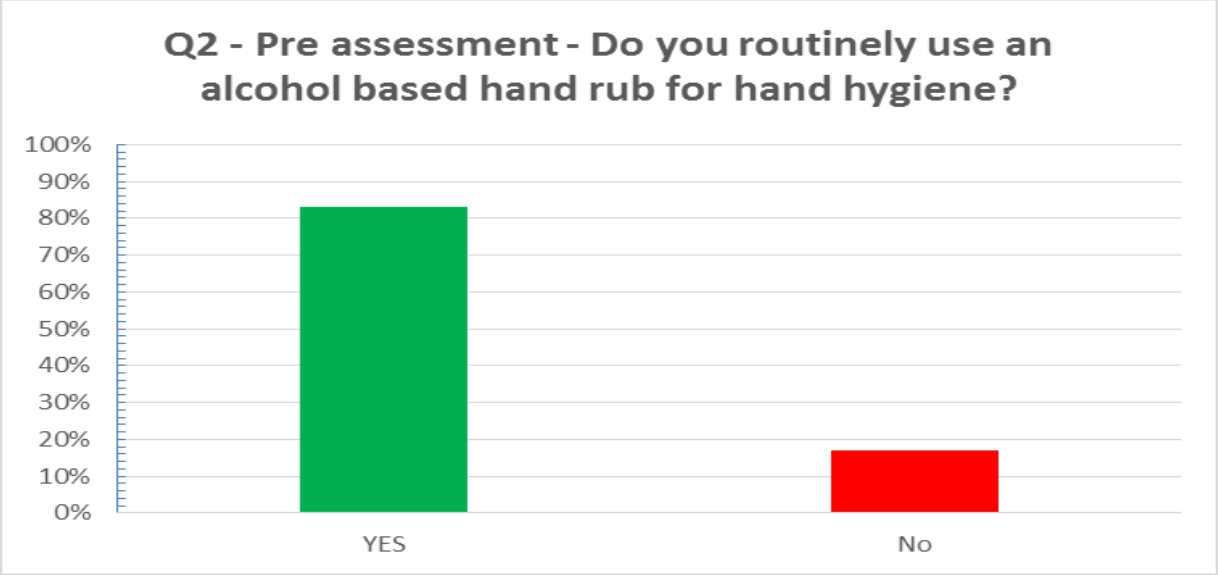

Figure 6 : Responses to Q2 in the pre education and training assessment (Do you routinely use an alcohol-based hand-rub for hand hygiene?)

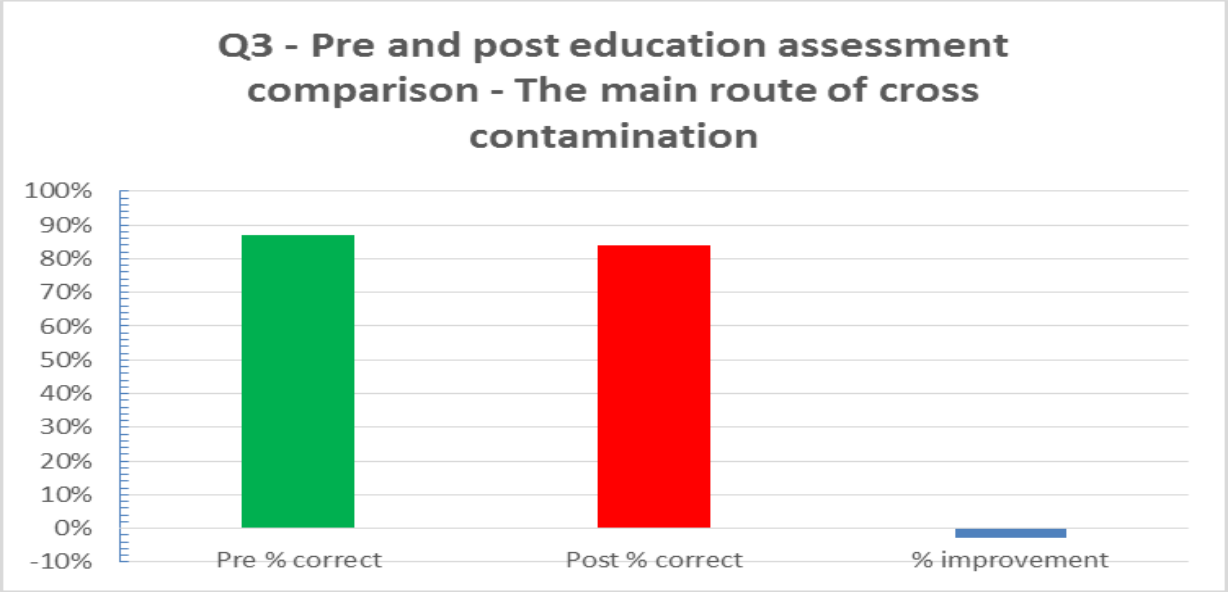

Figure 7 : A comparison of pre training responses and post training responses to Q3 in the pre and post education and training assessments (Identifying hands as the main route of cross contamination).

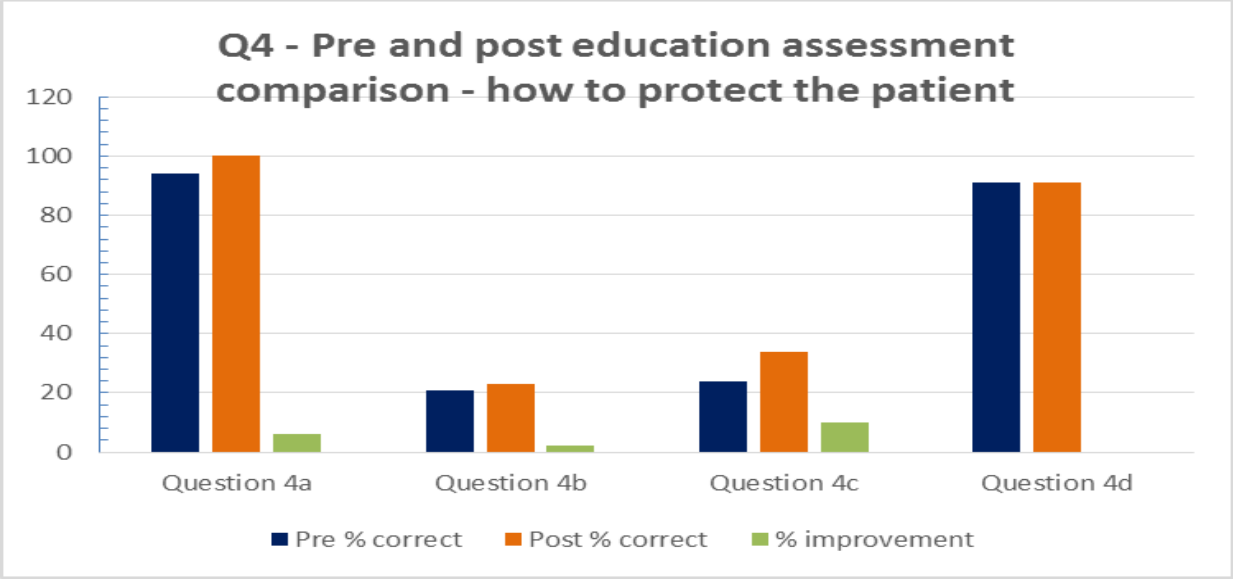

Figure 8 : A comparison of pre training responses and post training responses to Q4 in the pre and post education and training assessments (Identifying hand hygiene actions which protect the patient).

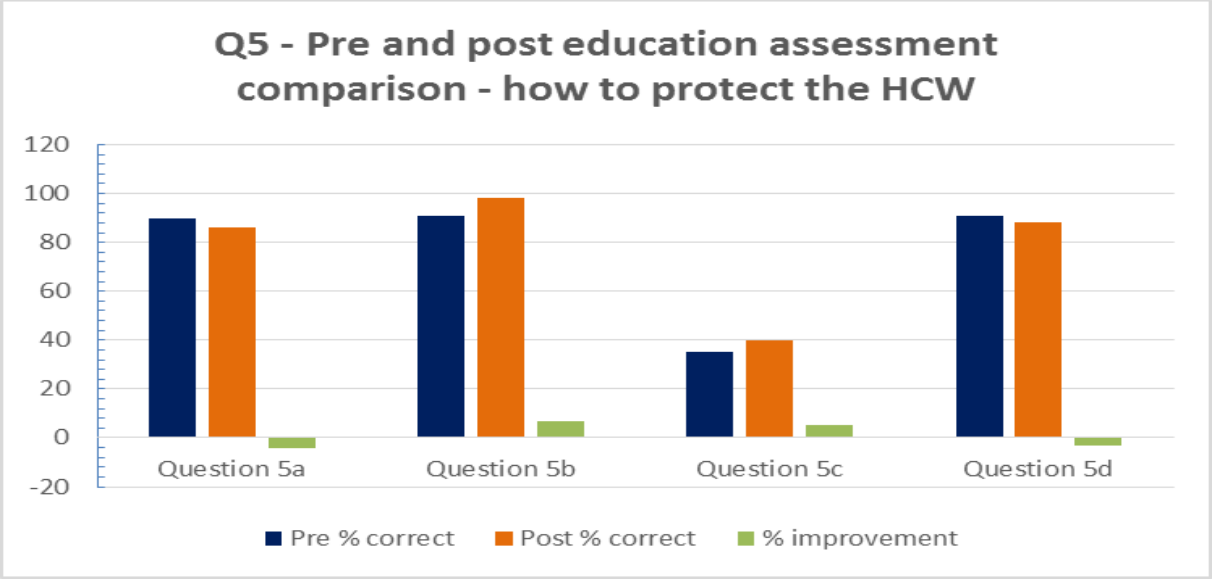

Figure 9 : A comparison of pre training responses and post training responses to Q5 in the pre and post education and training assessments (Identifying hand hygiene actions which protect the HCW).

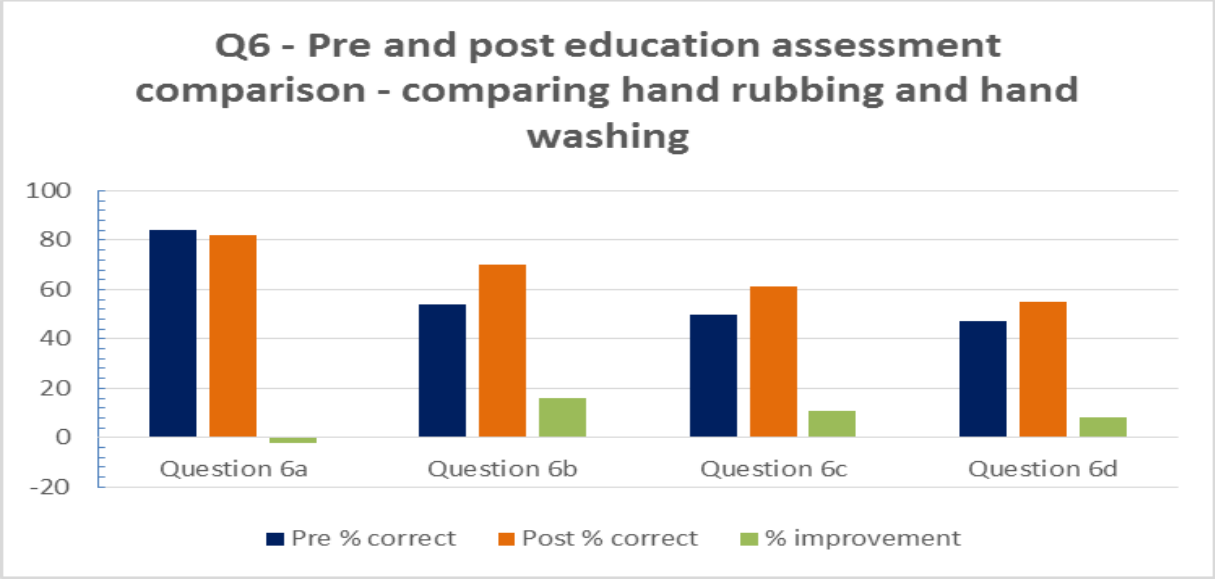

Figure 10 : A comparison of pre training responses and post training responses to Q6 in the pre and post education and training assessments (Identifying differences between hand-rubbing and hand-washing).

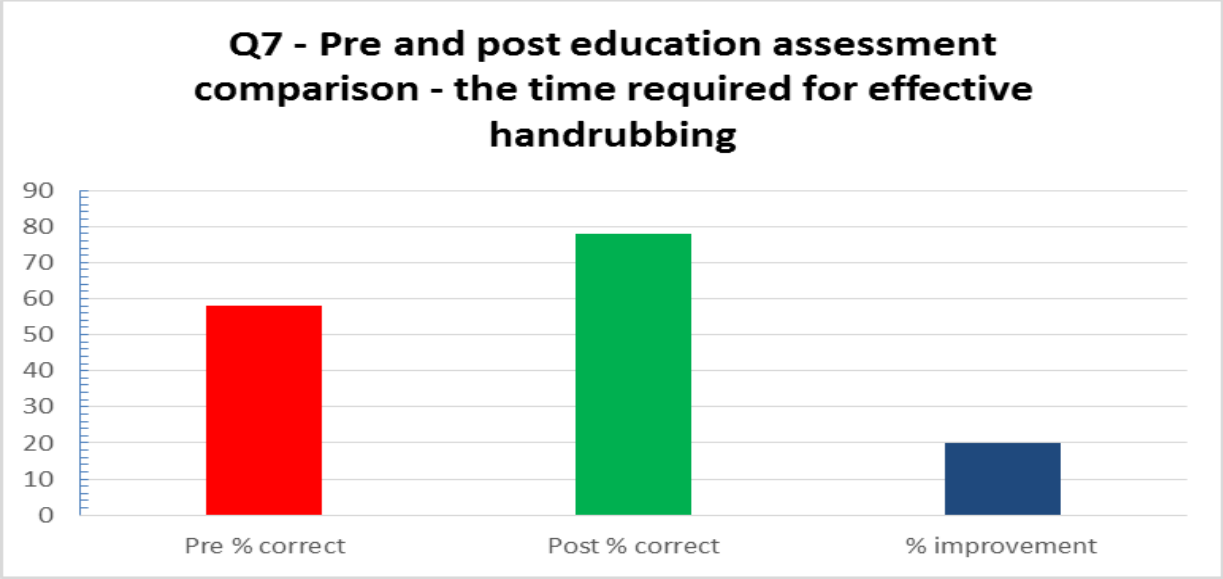

Figure 11 : A comparison of pre training responses and post training responses to Q7 in the pre and post education and training assessments (Identifying the correct minimum time required to ensure correct hand-rubbing technique).

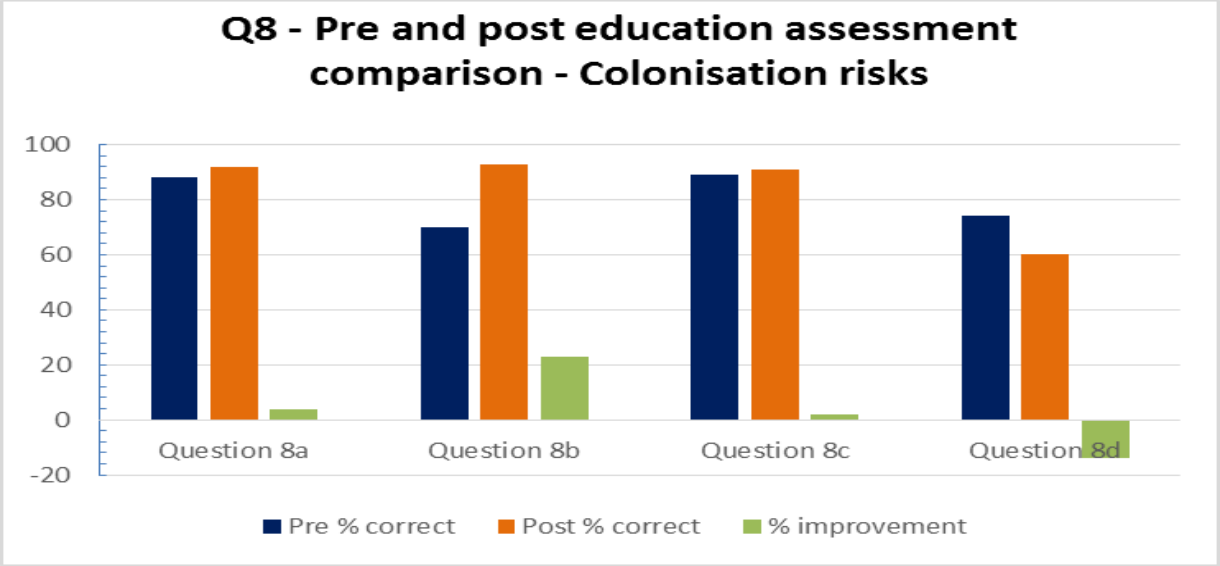

Figure 12 : A comparison of pre training responses and post training responses to Q8 in the pre and post education and training assessments (Identifying correctly a number of hand colonisation risks).

The infection control committee reviewed the pre and post assessment response comparisons and some observations were made. When asked if they had received formal hand hygiene training in the past 2 years, 10% of respondents replied that they had not. This was an immediate concern for the committee as, in theory, every employee who interacts with patients should have taken mandatory training whether at induction (for newly hired employees) or during the previous two years as part of the hospital hand hygiene training programme. It was agreed therefore that the hospital hand hygiene education and training tracking system should be investigated for any possible errors or gaps in the system. Another response of significant concern to the team was the fact that 17% of participants replied that they did not routinely use hand-rub. While the majority of questions posed did have improvements, these improvements were modest and only one question (Q4a: hand hygiene is required before touching a patient) delivered a 100% score from all respondents in the session. The committee also observed that other questions actually decreased in terms of correct scores after the education and training session.

The January 2015 education and training session also contained demonstration and a practical assessment which was designed to test whether participants could apply their newly-gained knowledge in a classroom environment. To this end, participants were asked to display appropriate hand-washing and hand-rubbing technique at a sink. As regards hand-rubbing, training gel with fluorescent properties and a glow box were provided for the participants. The training gel contains a fluorescent ingredient that reflects ultraviolet (UV) light. The glow box is a portable compartment (with a black background) that houses a UV bulb/lamp. Participants were asked to apply the gel to their hands, carry out the correct hand-rubbing procedure and then to place their hands inside the glow box under the UV source. If the participants had carried out

the correct hand-rubbing procedures then all areas of the hand would fluoresce (display a purple colour), however, if they had not carried out the correct procedures a white colour would appear on the un-rubbed parts of their hands. Each participant was taken through this process (sometimes repeatedly) until they passed the practical test.

Concerned about the above results from the pre and post education and training assessments and conscious that I would not gain an understanding of knowledge levels from the population of the staff that would not be due for imminent re-training; I decided to circulate a knowledge and perception survey to other HCWs. This survey (survey 2) was circulated to 10% of the entire staff population including 10% of all HCW disciplines in March 2015. I took the opportunity to add some perception-based questions to gauge not only levels of knowledge but also to further understand the perceptions of staff with regard to hand hygiene compliance. In situations where O.D. is applied, measurement in relation to attitudes and behaviours is required (Senior and Swailes, 2010).

In this perception and knowledge survey (Appendix 4), questions 1-5 related directly to material discussed in hand hygiene training sessions. Questions 6-13 were perception-based questions. In questions 6-8, participants were asked about local actions that would be effective in improving hand hygiene. In questions 9-11, participants were asked about their perceptions of others. In Question 12 participants were asked about the effort taken to perform good hand hygiene. Finally in question 13, participants were asked to self-assess their hand hygiene compliance rate. The data from this knowledge and perception survey is summarised in figures 13-32 below:

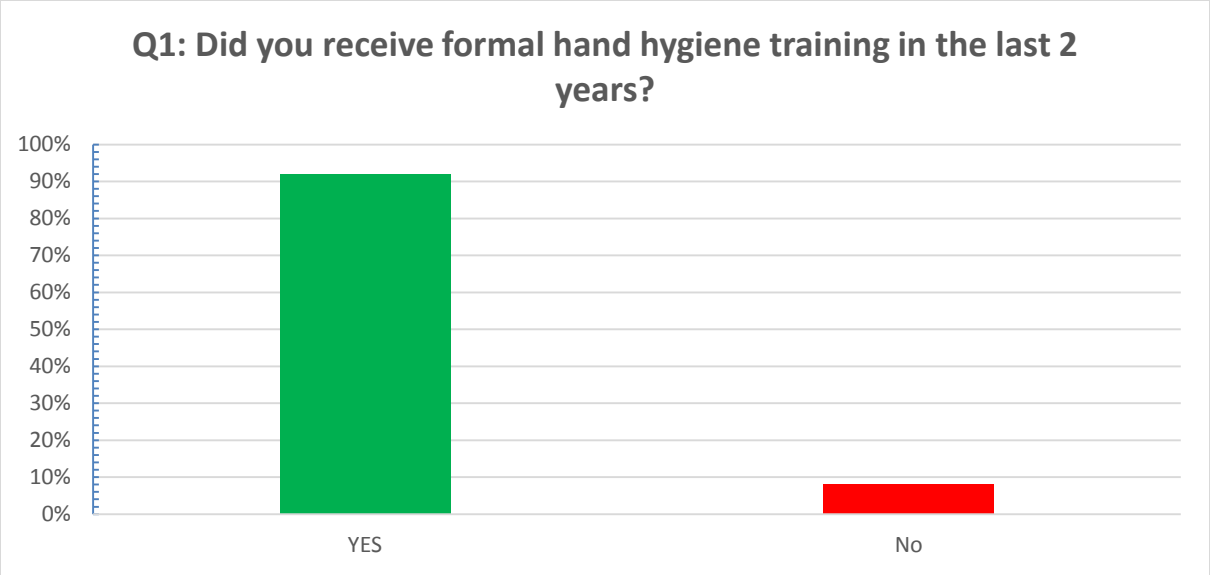

Figure 13: Responses to Q1 in the knowledge and perception survey (Did you receive formal training in hand hygiene in the last two years?)

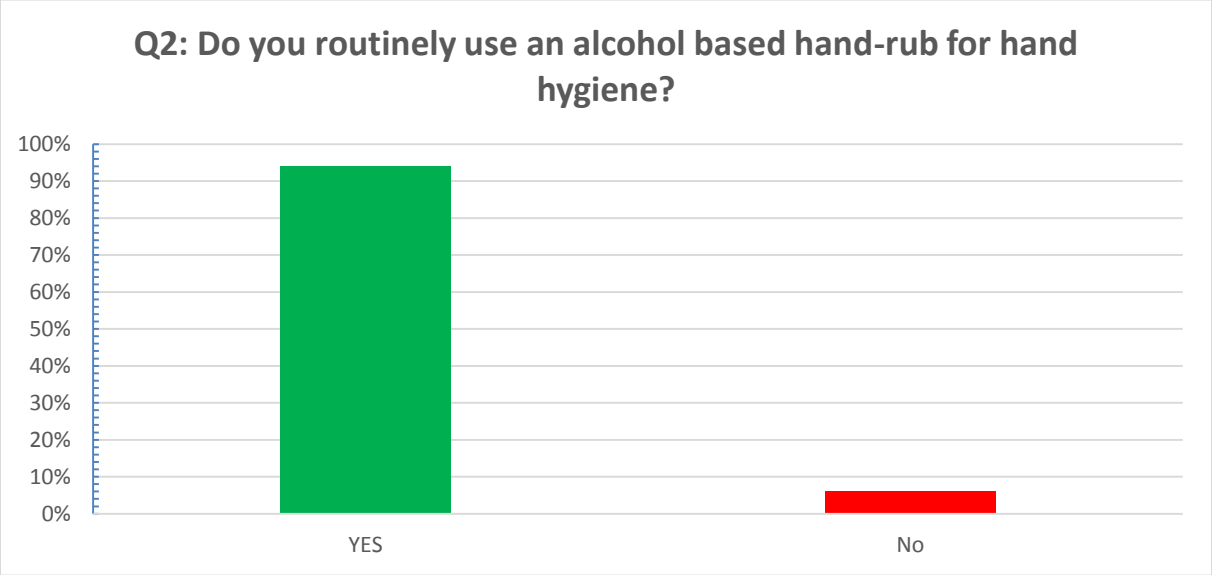

Figure 14: Responses to Q2 in the knowledge and perception survey (Do you routinely use an alcohol based hand-rub for hand hygiene?)

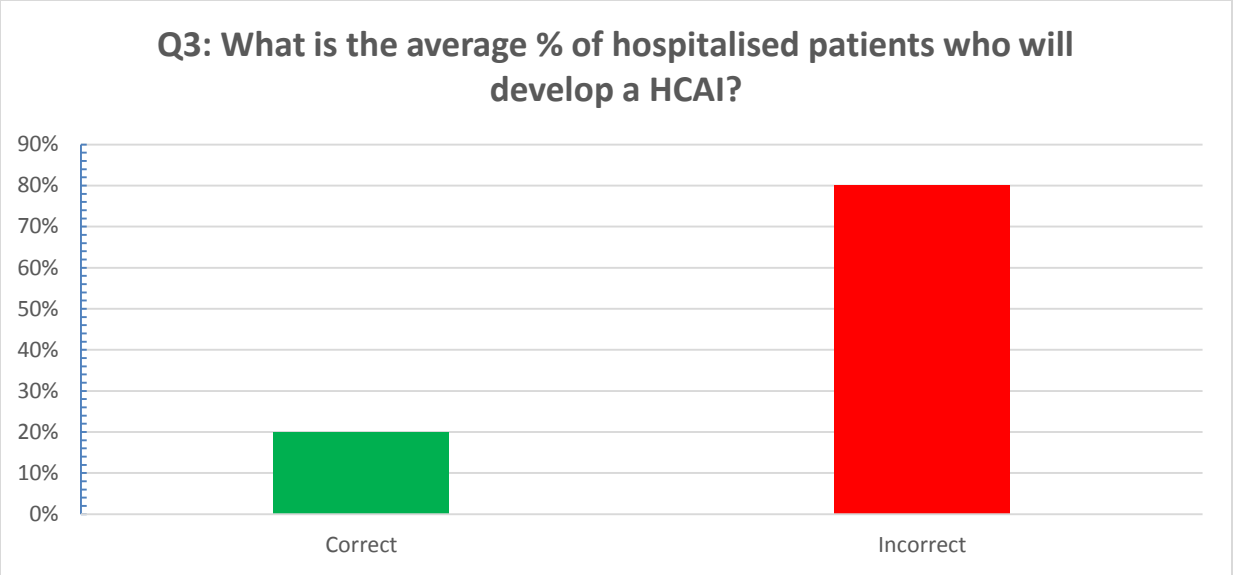

Figure 15: Responses to Q3 in the knowledge and perception survey (What is the average % of hospitalised patients who will develop a HCAI?)

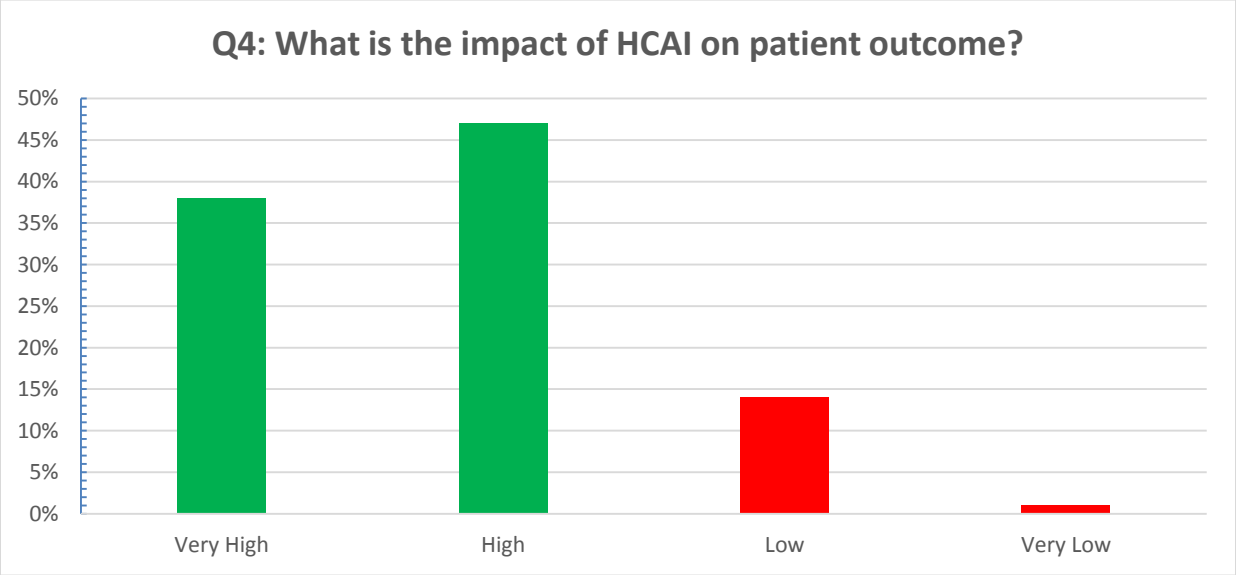

Figure 16: Responses to Q4 in the knowledge and perception survey (What is the impact of HCAI on patient outcome?)

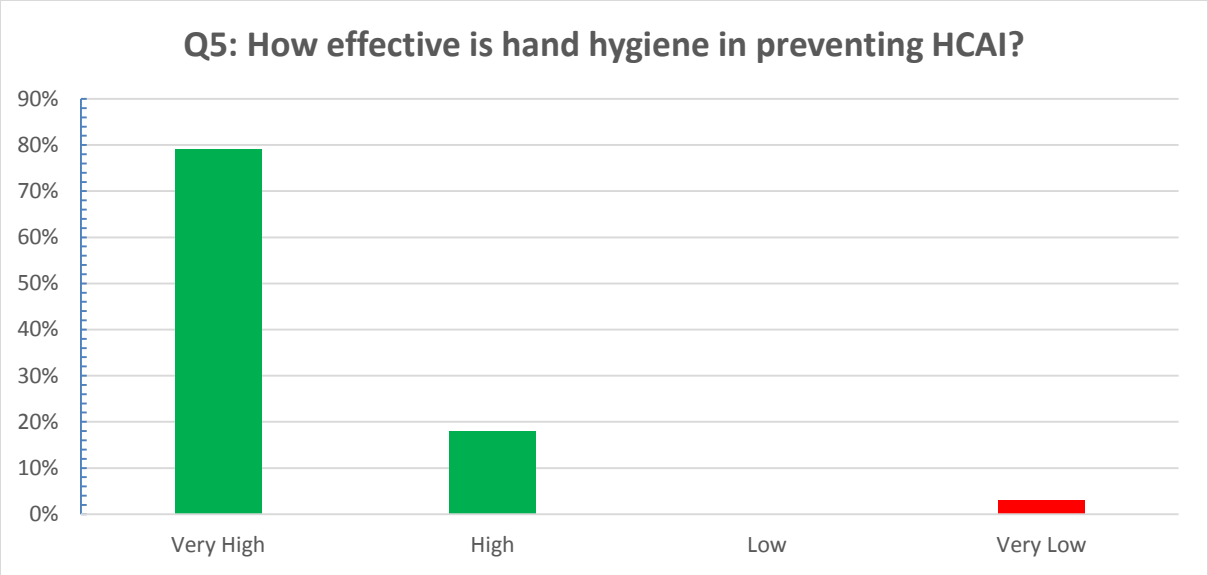

Figure 17 : Responses to Q5 in the knowledge and perception survey (How effective is hand hygiene in preventing HCAI?)

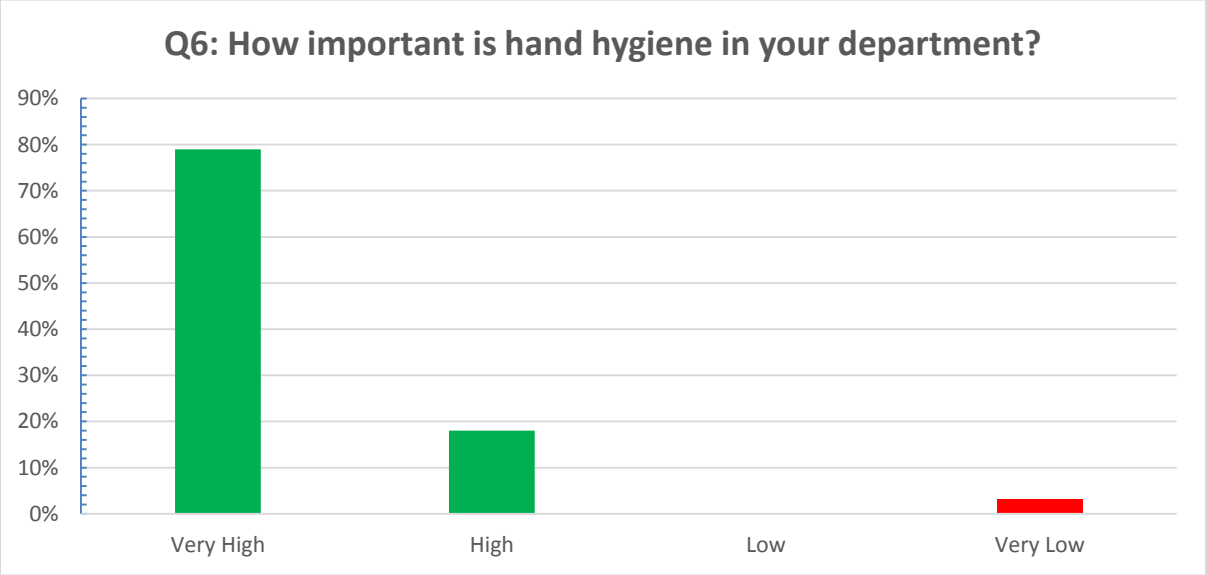

Figure 18 : Responses to Q6 in the knowledge and perception survey (How important is hand hygiene in your department?)

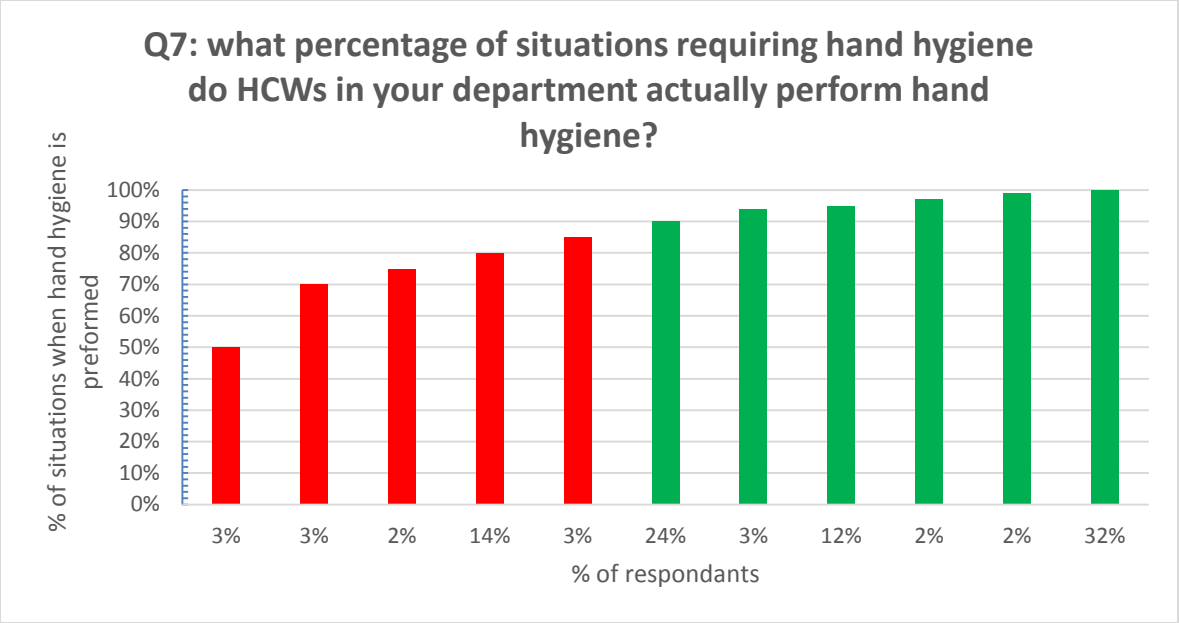

Figure 19: Responses to Q7 in the knowledge and perception survey (What percentage of situations requiring hand hygiene do HCWs in your department actually perform hand hygiene?)

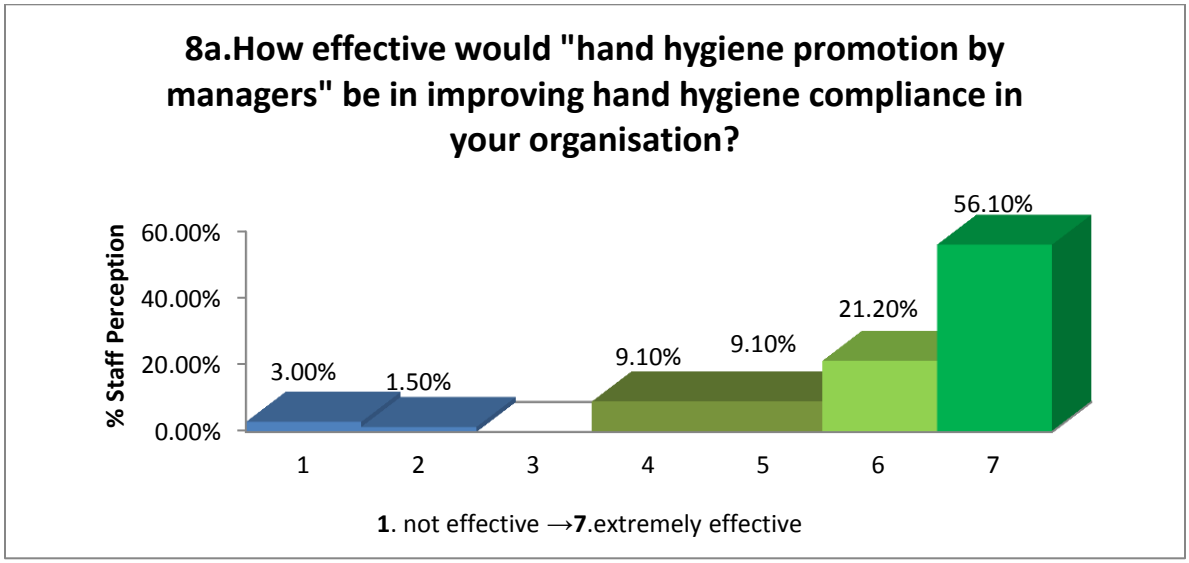

Figure 20: Responses to Q8a in the knowledge and perception survey (How effective would "hand hygiene promotion by managers" be in improving hand hygiene compliance in your organisation?)

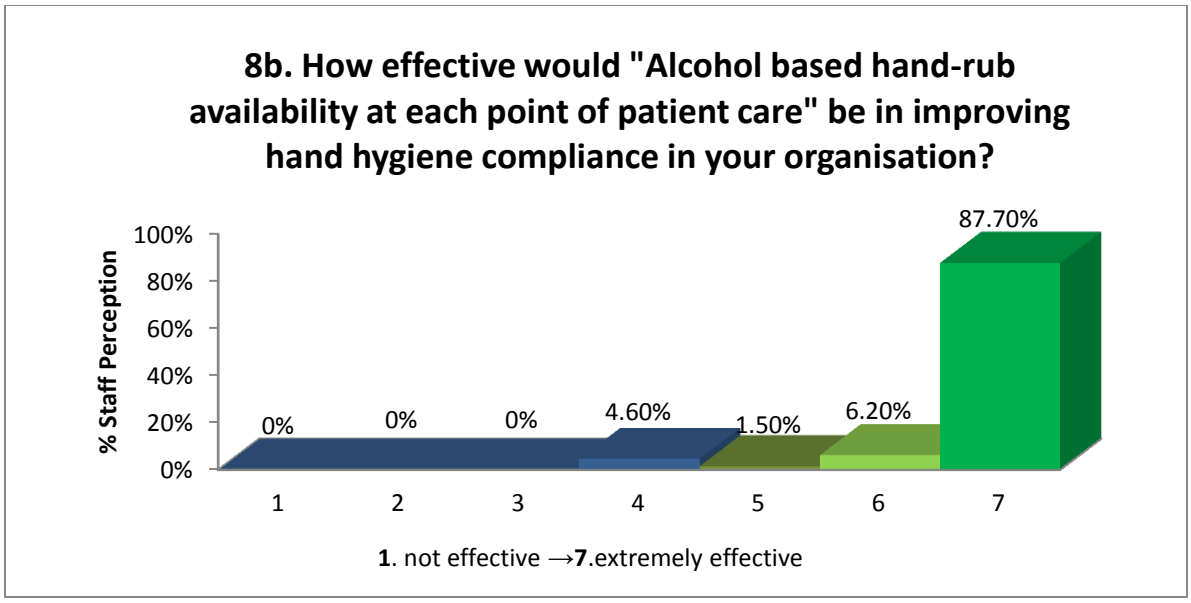

Figure 21: Responses to Q8b in the knowledge and perception survey (How effective would "Alcohol based hand-rub availability at each point of patient care" be in improving hand hygiene compliance in your organisation?)

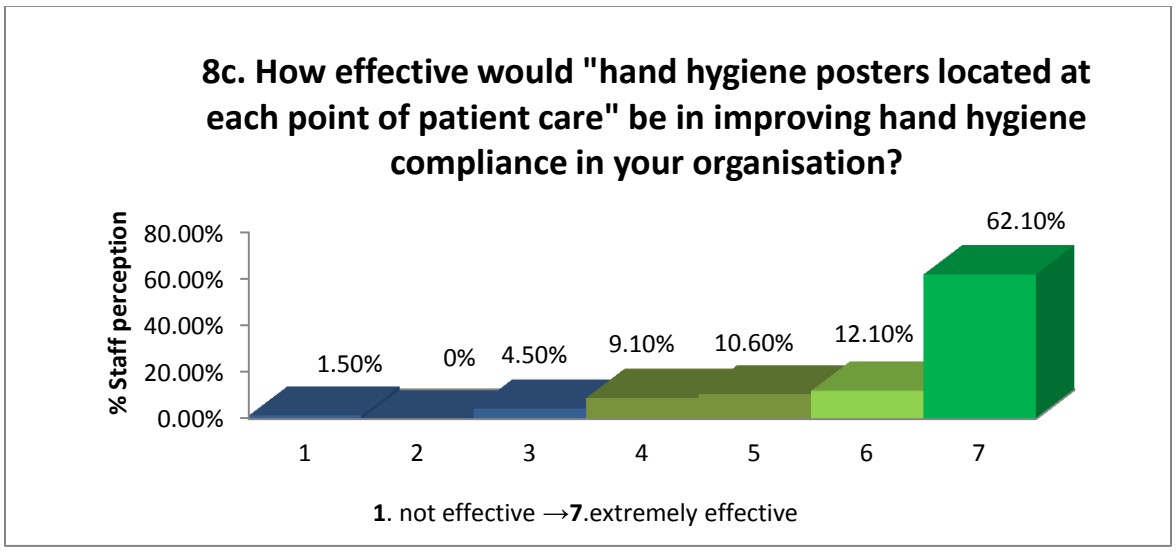

Figure 22: Responses to Q8c in the knowledge and perception survey (How effective would "hand hygiene posters located at each point of patient care" be in improving hand hygiene compliance in your organisation?)

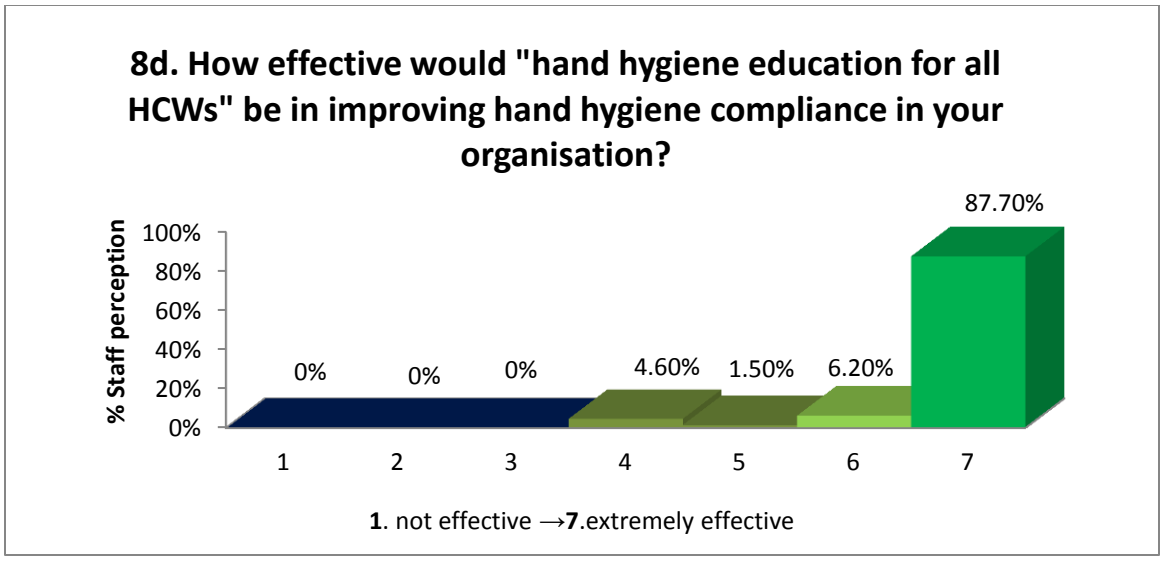

Figure 23: Responses to Q8d in the knowledge and perception survey (How effective would "hand hygiene education for all HCWs" be in improving hand hygiene compliance in your organisation?)

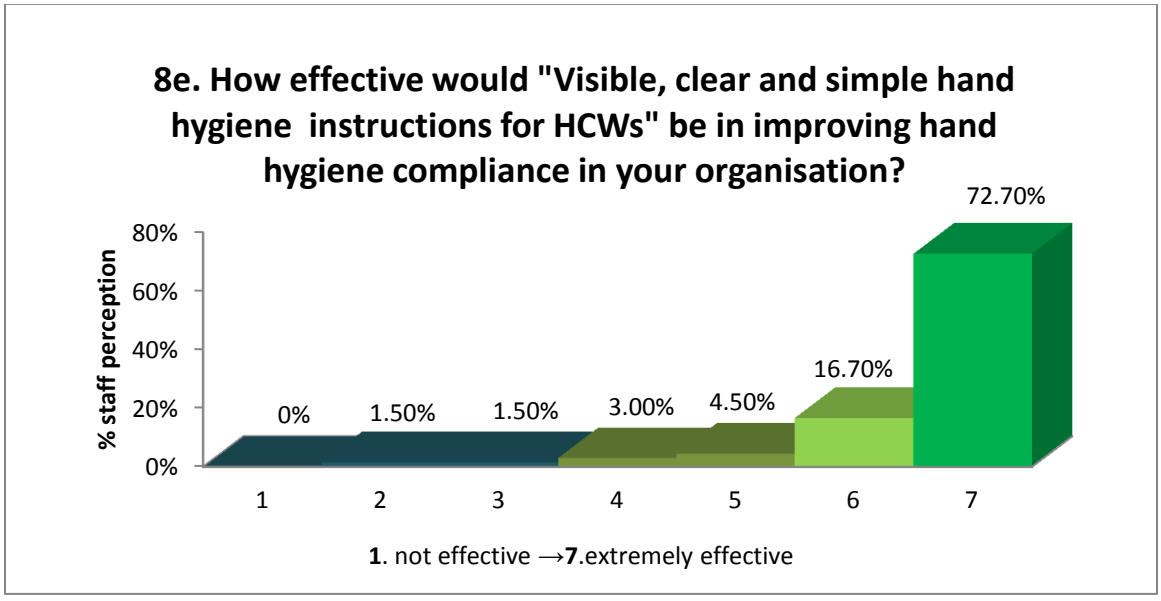

Figure 24: Responses to Q8e in the knowledge and perception survey (How effective would "Visible, clear and simple hand hygiene instructions for HCWs" be in improving hand hygiene compliance in your organisation?)

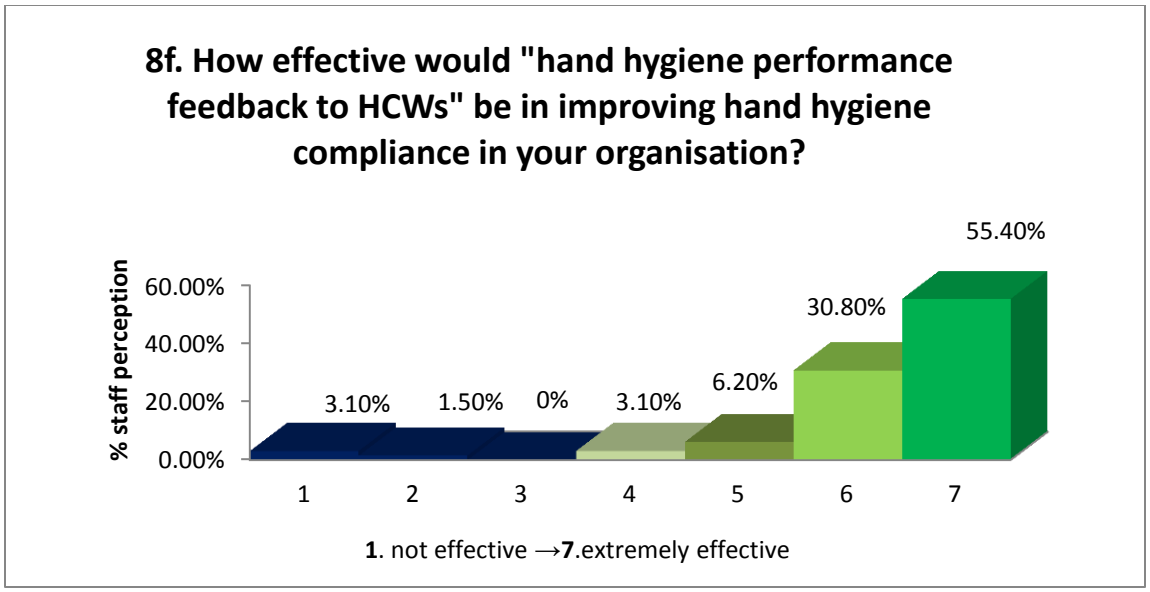

Figure 25: Responses to Q8f in the knowledge and perception survey (How effective would hand hygiene performance feedback to HCWs" be in improving hand hygiene compliance in your organisation?)

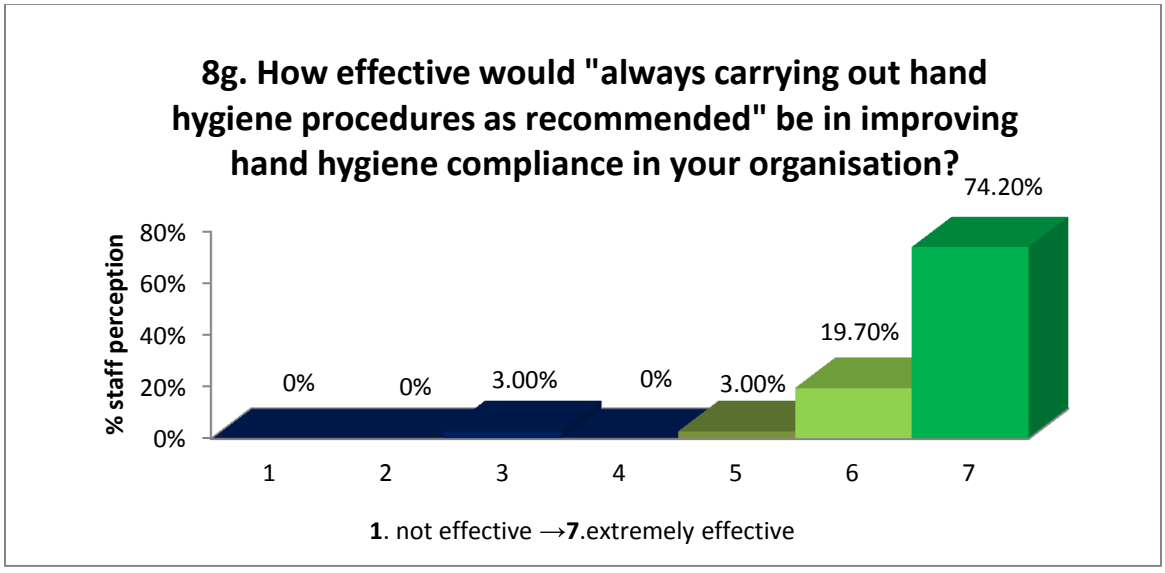

Figure 26: Responses to Q8g in the knowledge and perception survey (How effective would always carrying out hand hygiene procedures as recommended" be in improving hand hygiene compliance in your organisation?)

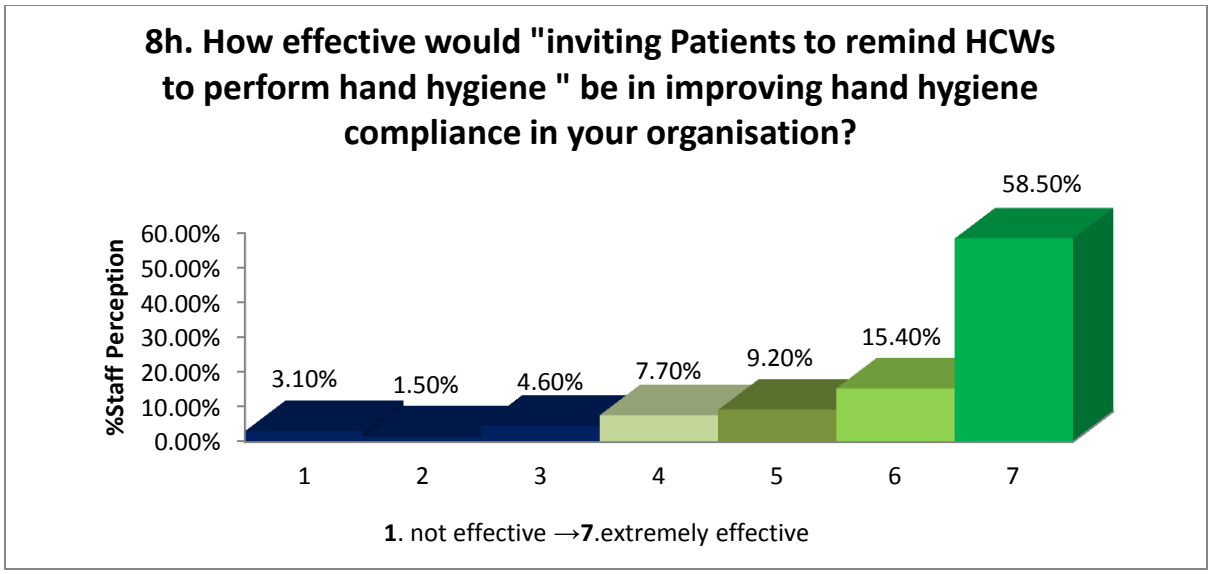

Figure 27: Responses to Q8h in the knowledge and perception survey (How effective would inviting Patients to remind HCWs to perform hand hygiene "be in improving hand hygiene compliance in your organisation?)

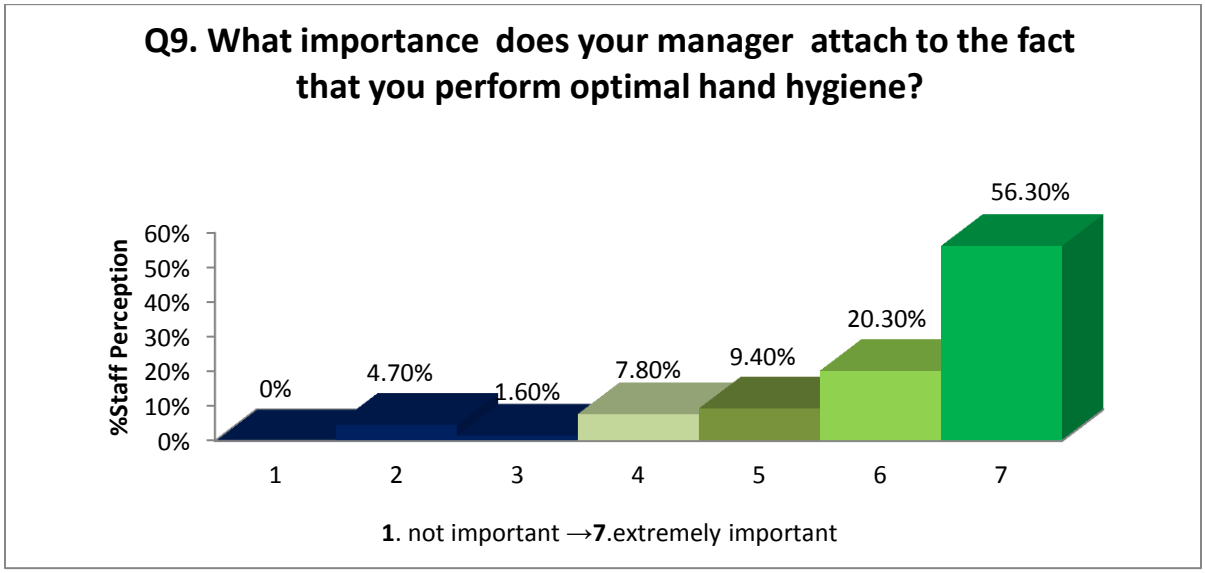

Figure 28: Responses to Q9 in the knowledge and perception survey (What importance does your manager attach to the fact that you perform optimal hand hygiene?)

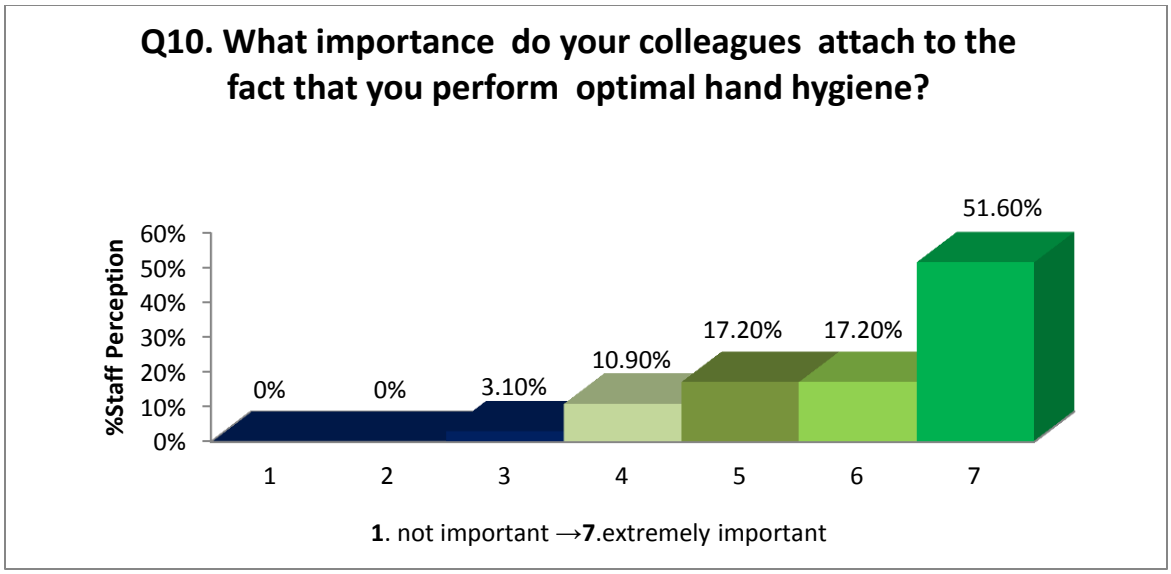

Figure 29: Responses to Q10 in the knowledge and perception survey (What importance do your colleagues attach to the fact that you perform optimal hand hygiene?)

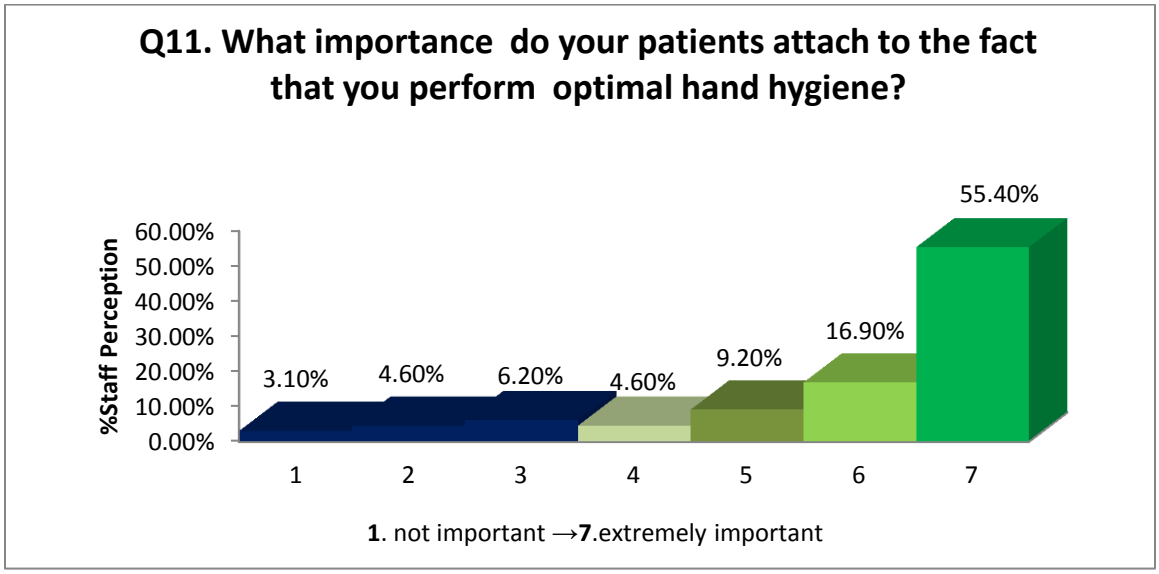

Figure 30: Responses to Q11 in the knowledge and perception survey (What importance do your patients attach to the fact that you perform optimal hand hygiene?

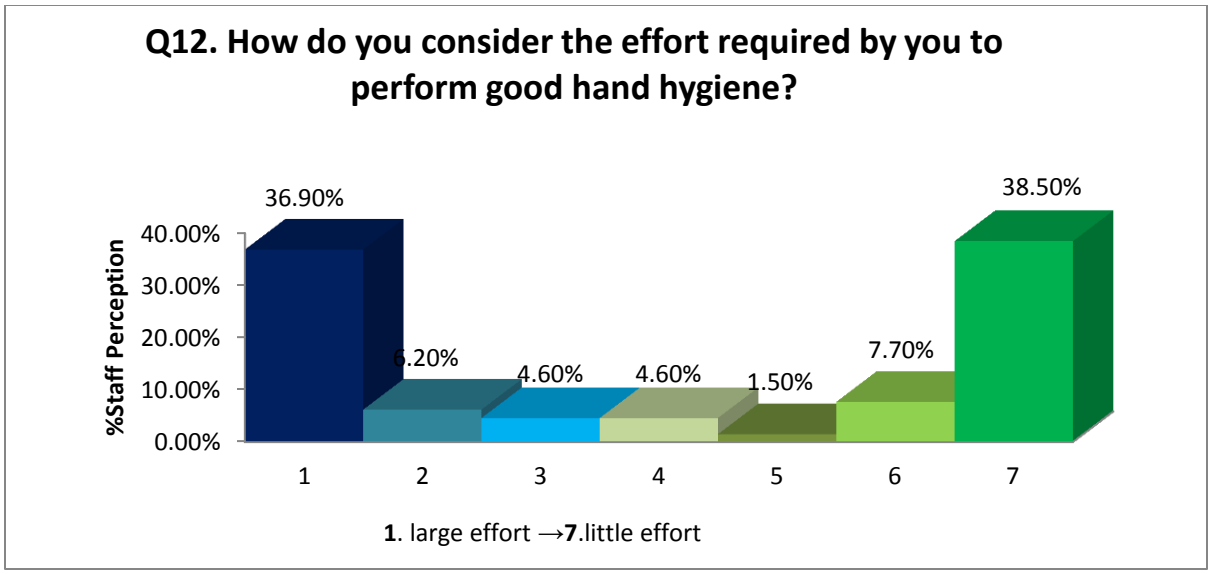

Figure 31: Responses to Q12 in the knowledge and perception survey (How do you consider the effort required by you to perform good hand hygiene?)

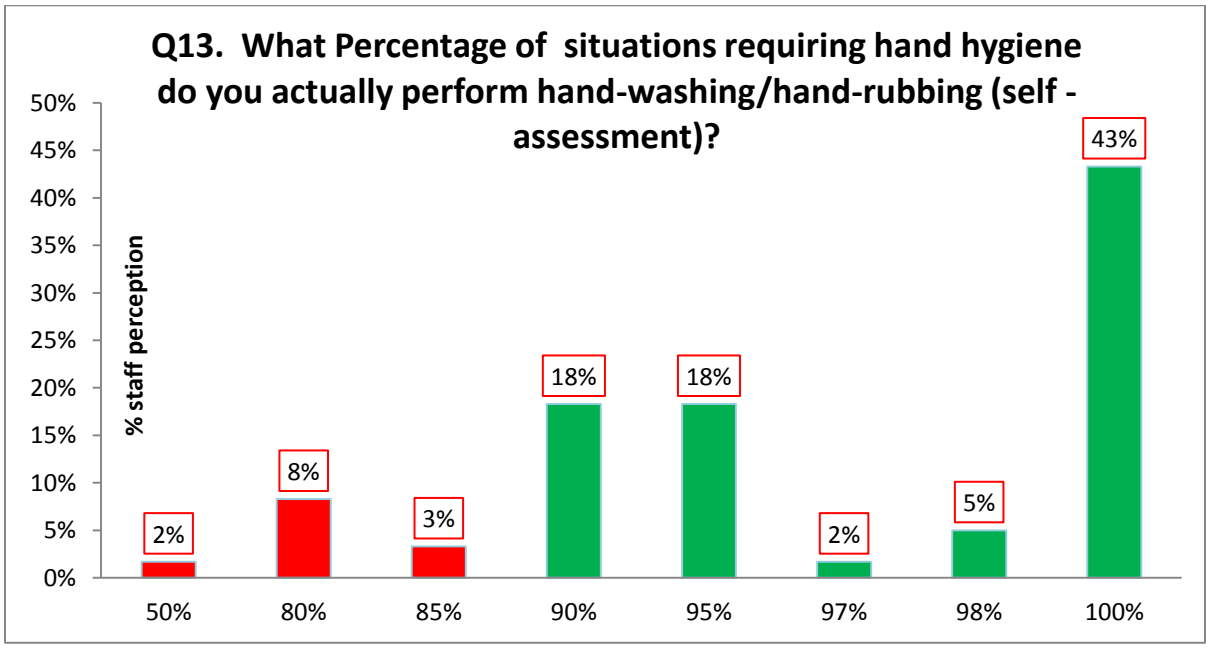

Figure 32: Responses to Q13 in the knowledge and perception survey (Self-Assessment; What percentage of situations requiring hand hygiene do you actually perform hand-washing/hand-rubbing?).

The infection control committee reviewed the knowledge and perception survey responses and some observations were made. When asked if they had received formal hand hygiene training in the past two years (Q1), 8% of respondents replied that they had not. This response was similar to the response rate measured in the pre ad post assessment responses (10%) and was confirmed as an area of immediate concern for the committee. Another response of significant concern (Q2) to the team was the fact that 6% of participants replied that they did not routinely use hand-rub. This response rate is different from the response rate reported in the pre and post assessment survey (17%) but again gives cause for concern.

With regard to Q6-13 which were perception based questions a number of observations were made. An overwhelming majority of participants (94%) agreed that hand hygiene was either a high, or very high priority within their own department, yet only 77% replied that their manager attached high or very high importance to hand hygiene and only 69% replied that their colleagues attached high or very high importance to hand hygiene. When asked for their perception of their own hand hygiene compliance rate, 86% replied that their compliance rate was >/= 90%, however when asked about the compliance rate of their colleagues, only 75% of respondents believed that the compliance rate was >/= 90%, lending weight to the argument that HCWs can have an inflated view of the own compliance rates (WHO, 2009b).

Finally in Q8a-8h, participants were asked what kinds of interventions would be most effective (in their opinion) in helping to drive improvements in hand hygiene compliance. The responses are summarised in the following graph (See Figure 33):

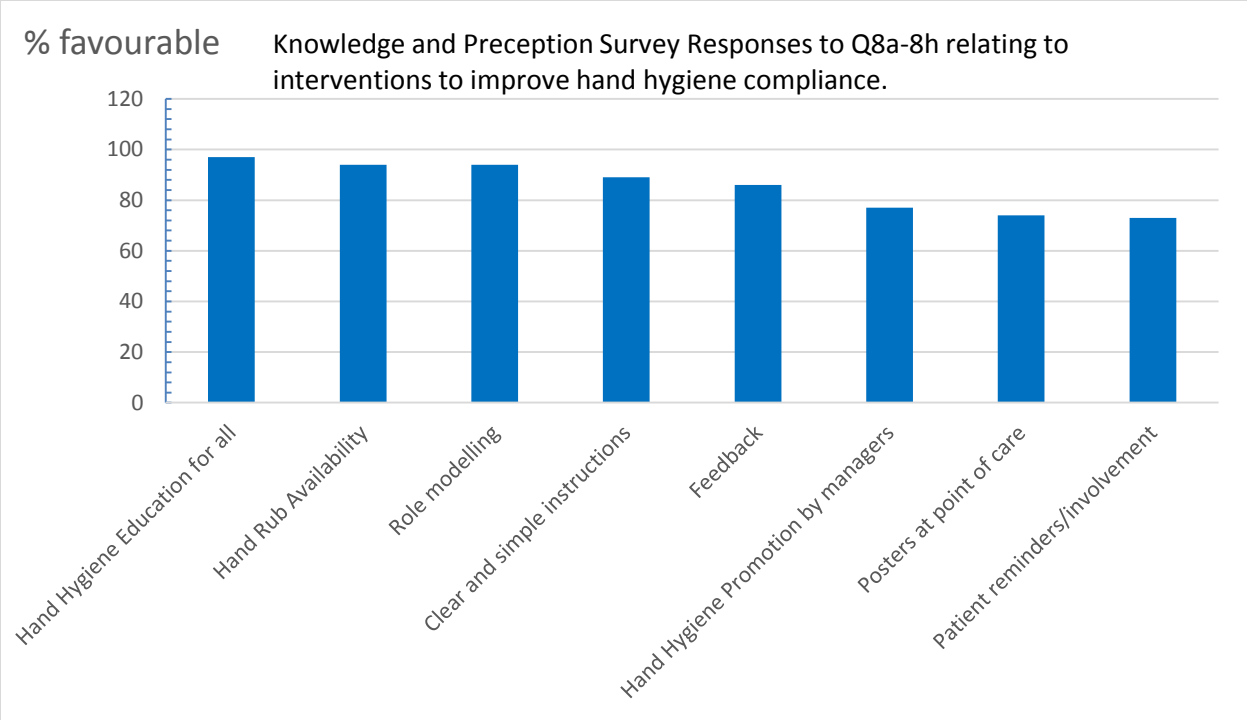

Figure 33: Summarised responses to Q8a-h in the knowledge and perception survey indicating which interventions might advance hand hygiene compliance rates.

Based on the responses from the knowledge and perception survey, the committee confirmed that mandatory hand hygiene education and training attendance was a systematic gap that would need to be addressed immediately. A second observation was that the use of hand-rub was not embedded in the HCW population and that usage rates (as tracked by the pharmacy department) should be measured. An assessment of the average hand hygiene compliance rate by respondents of their own departments suggests that success in the national hand hygiene audit (target >/= 90%) would be marginal at best.

However, based on the findings the committee agreed that the information contained would be valuable in addressing the perceived barriers to compliance, particularly the responses to Q8 which were seen as clues to how this population of HCWs and this culture can be influenced and supported to improve hand hygiene compliance. The committee agreed therefore, that Objective 1b (Understand the barriers to hand hygiene compliance by devising and circulating surveys to a sample of relevant staff members for a local perspective) had been successfully achieved.

4.3.3 Behaviours:

In the case of "behaviours" or impact of the education and training interventions, it was possible to measure whether staff could apply their knowledge with regard to hand hygiene compliance in their work area by carrying out direct observation audits. Opportunities and compliance (or lack of compliance) were recorded (see Table 9).

Area Code	Local Audit score	Repeat Local Audit Score
C	90%	NA
M	90%	NA
E	83%	90%
I	93%	NA
D	93%	NA
C1	97%	NA
R	83%	93%
H	90%	92%

Table 9: A summary of hand hygiene compliance scores for seven randomly selected areas within the hospital as part of the Q4 2014 – Q1 2015 hand hygiene compliance audit.

This data shows that while the hospital (H) would have just passed the success criteria (>/= 90%), two of the seven selected areas for audit failed the criteria. The failing areas were given feedback and direction on how to close their gaps and passed a repeat audit in the following weeks. Underlying data from these direct observation internal audits showed that the leading reason for non-compliance was a failure to observe the first moment of hand hygiene (before patient contact) and that this non-compliance was, in the majority, related to medical staff.

4.3.4 Results:

The ultimate measure of success/failure, is the national hand hygiene audit score (HPSC, 2012) and while the organisation and the success of this project will be judged against the impending national audit results (May/June, 2015), historical data from the HPSC website can be used to establish the baseline compliance rate as per Objective 2 of the project. The HPSC website contains the hand hygiene compliance rates for all HSE hospitals in the Republic of Ireland from 2011 when the programme commenced to the present date. The historical data for our organisation (see Table 10) served as the pre-implementation baseline for this O.D. change.

Period	Hospital Compliance	LCI	UCI	HSE Average	HSE Target	Time of Year
1				74.7	75	March/April 2011
2	78.1	71.9	83.5	79.6	75	Oct/Nov 2011
3	85.2	79.7	89.7	81.6	85	May/June 2012
4	90.5	85.7	94.1	84.3	85	Oct/Nov 2012
5	92.4	87.9	95.6	85.2	90	May/June 2013
6	95.2	91.4	97.7	86.2	90	Oct/Nov 2013
7	91.0	86.2	94.5	85.6	90	May/June 2014
8	90.0	85.1	93.7	87.2	90	Oct/Nov 2014

LCI/UCI: lower and upper 95% confidence intervals

Table 10: Hospital hand hygiene compliance rates by programme period compared to the HSE average score for each period and compared to the (increasing) HSE target. Note: The organisation was not included in the Period 1 audits as the hospital did not have trained and validated internal auditors at that time.

4.4 Observations:

A number of observations can be made from our data on the HPSC website relating to the first KPI, i.e., hand hygiene compliance. From Period 2 to Period 8, the hospital achieved the targets for hand hygiene compliance and the hospital score has increased period by period until Period 7 when the hospital score decreased for the first time. There was a further decrease in Period 8. Further investigation into the raw data by moment of hand hygiene (see Table 11) and HCW role (see Table 12) level shows that in Period 8, the Auxiliary and Medical Staff compliance rates have dropped and that this reduction was related to Moment 1 (Before patient contact) of the WHO "Five Moments for Hand Hygiene" (WHO, 2009b). This data correlates well with the local audit carried out in January 2015 (see Table 9).

Moment	Description	P1	P2	P3	P4	P5	P6	P7	P8
1	Before contact	NA	76	85	87	89	90	96	84
2	Before Asceptic procedure	NA	75	83	89	94	100	90	91
3	After Body fluid exposure risk	NA	84	90	92	92	100	86	94
4	After contact	NA	81	87	91	93	93	88	90
5	After touching patient surroundings	NA	74	80	93	92	92	96	93
Hospital		NA	78	85	90.5	92	95	91.2	90

Table 11: Hand hygiene compliance rates for the hospital as documented for each of the last seven national audits. Data is displayed at the hand hygiene moment level for each of the "Five Moments for Hand Hygiene" (WHO, 2009b).

Professional Group	P1	P2	P3	P4	P5	P6	P7	P8
Nurses/HCAs	NA	82	87	91	95	99	90	94
Auxillary Staff	NA	79	85	89	91	93	91	88
Medical Staff	NA	68	82	90	90	93	91	84
AHPs	NA	83	86	92	92	95	93	92
Hospital	NA	78	85	90.5	92	95	91.3	90

Table 12: Hand hygiene compliance rates for the hospital as documented for each of the last seven national audits. Data is displayed at the job description level.

The high level results of the local audit carried out in January 2015 (see Table 9) suggest that Objective 4 of the project (Conduct studies to assess whether enhanced training and educational materials have realised an improvement in compliance rates) has not been achieved. An analysis of the raw data showed that the primary reason for non-compliance was the failure of medical staff to adhere to moment 1 of the five moments for hand hygiene (WHO, 2009b).

However, comparing this local audit data to the historical baseline data, it can be said that compliance among Medical staff has been consistently sub-optimal while Auxiliary staff compliance has improved and Nursing and AHP have continued to perform well. This would suggest that Objective 4 has been achieved in three of the four cohorts of staff who were audited.

4.4.1 Other sources of data:

The second KPI is hand hygiene education and training compliance. Having identified a potential issue with regard to a lack of attendance at education and training sessions, training records were reviewed. The data below (see Table 13) documents the training compliance rates for all relevant disciplines up to September 2014.

Sept 2014	Total Number	Compliant Number	% compliant
Nurses/HCAs	317	242	76%
Clinicians	81	51	63%
AHPs	76	72	95%
Auxiliary Staff	129	75	58%
Totals	603	440	73%

Table 13: The hand hygiene training compliance rates for all relevant disciplines up to September 2014.

When I commenced this project in September 2014, it became clear that the tracking of hand hygiene training completion was a significant gap in our systems. The improvement in attendance was a critical and immediate area of focus for the team and for all front line

managers. By March 2015 the hand hygiene training attendance rates (see Table 14 and Figure 34) had improved significantly except in the Nursing/HCA cohort of staff.

Date	% Nurses/HCAs trained	% clinicians trained	% AHPs trained	% Aux staff trained	Average all staff
Sep-14	76%	63%	95%	58%	73%
Oct-14	77%	63%	97%	58%	74%
Nov-14	80%	68%	97%	46%	73%
Dec-14	78%	68%	98%	51%	74%
Jan-15	66%	69%	98%	60%	73%
Feb-15	66%	69%	98%	67%	75%
Mar-15	73%	88%	98%	74%	83%

Table 14: The hand hygiene training compliance rates for all HCW cohorts in the hospital from September 2014 to March 2015.

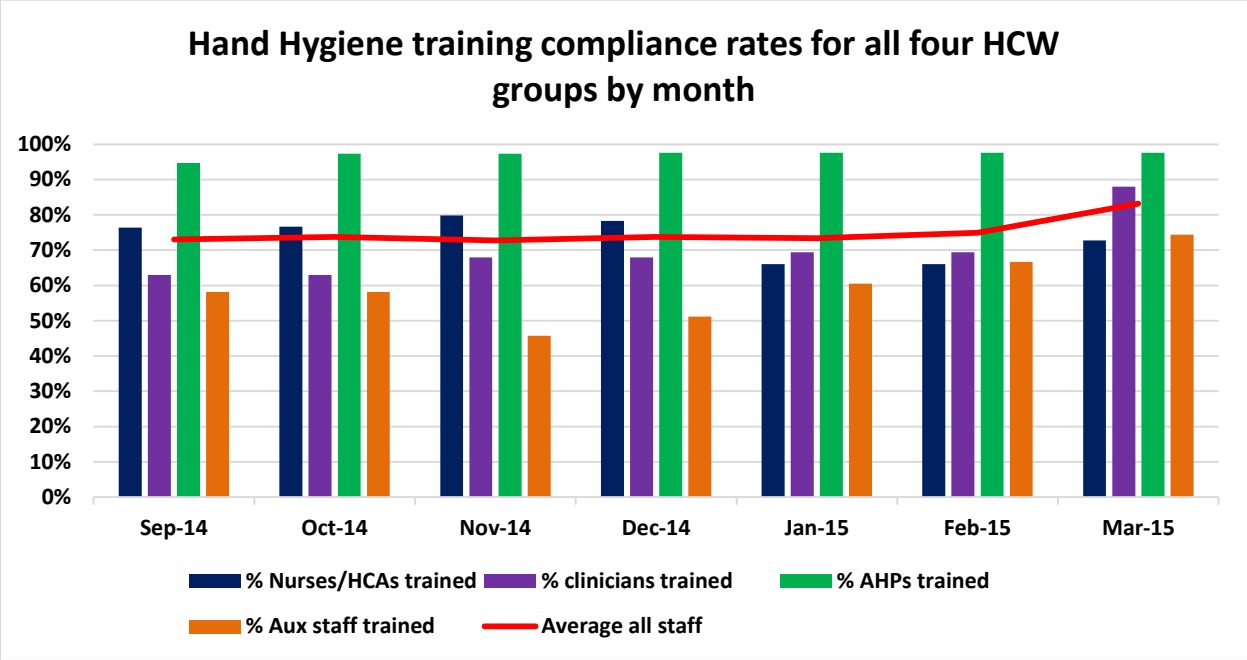

Figure 34: The hand hygiene training compliance rates for all HCW cohorts in the hospital from September 2014 to March 2015.

The data in Table 14 shows that in September 2014, Medical Staff and Auxiliary staff were well below the target of 100% hand hygiene training compliance. This lent weight to the perception observed in the education and training perception survey, that medical staff attendance was historically sub-optimal. As a result of findings in surveys 1 and 2, the frequency and emphasis on hand hygiene training sessions were increased. By the end of March 2015, the hand hygiene training compliance rate had increased from 73% overall (September 2014) to 83%.

The third KPI associated with the WHO hand hygiene improvement programme is the alcohol hand-rub consumption rate. This metric is also referenced as a target in the National Service plan (HSE, 2014) As a balancing measurement, I decided to see if the apparent lack of hand-rub technique by HCWs could be validated by reviewing actual hand-rub consumption data between 2012 - 2014. The following graph (see Figure 35) applies:

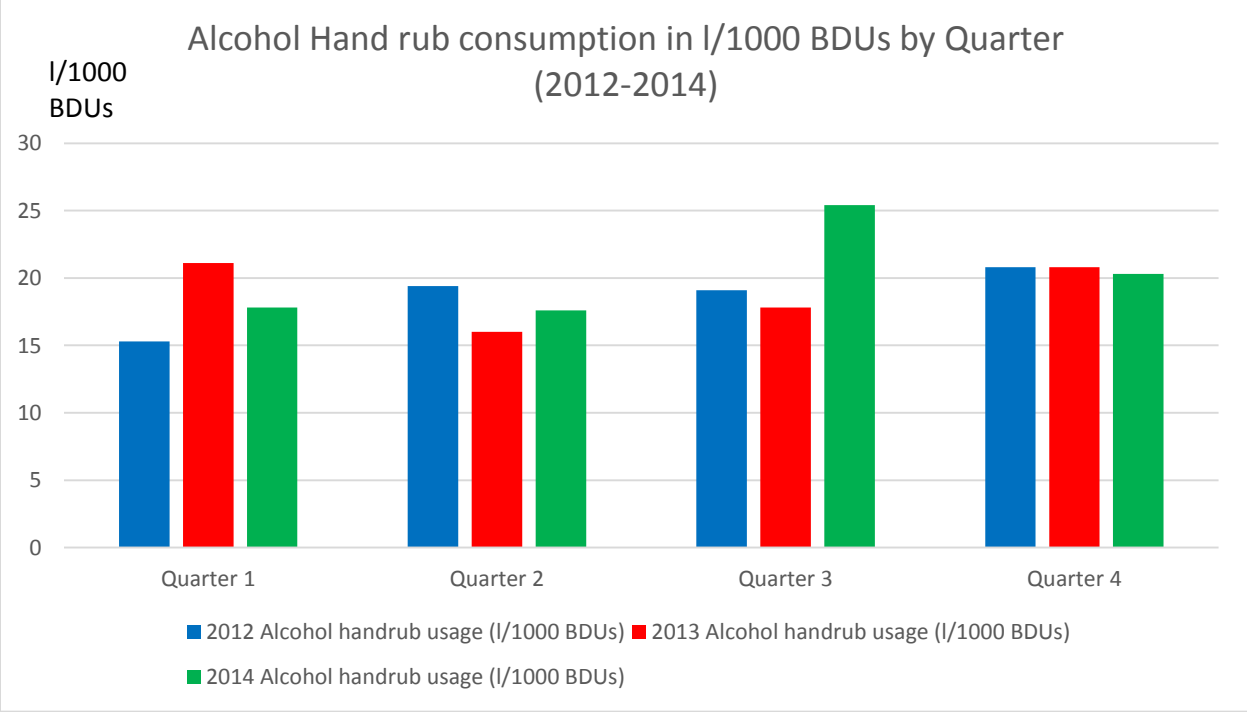

Figure 35: The hand-rub usage/consumption rates for the years 2012, 2013 and 2014 by quarter.

While the above graph (see Figure 35) does show that hand-rub usage has increased in 2014 relative to previous years, it also shows that usage in Quarter 4 2014 (compared to Quarter 3 2014) had decreased to 23.4 litres per 1000 bed days used (BDUs). However, a review of the raw data in 2014 shows that the actual number of BDUs had increased from an average of 16,809 over the previous three quarters to 18,004 BDUs in Q4 2014. Essentially, the hospital was busier and serviced more patients (9% increases), lending weight to the argument that increased workload impacts on hand hygiene compliance.

When the data associated with the three KPIs was presented to the implementation team and reviewed, the team agreed that they had sufficient information to understand the baseline performance of the organisation. The gaps associated with the three KPIs were also understood and the team could therefore move forward with the project in the knowledge that the correct countermeasures were put in place as per the action plan. Finally, the team agreed that the second project objective (determine the baseline of hand hygiene education and training compliance rates) had been achieved.

4.5 Summary

Evaluation can serve as a mechanism for accountability and is most effective as a tool in justifying organisational policies (Lazenbatt, 2002). It facilitates further assessment of the information gathered to develop, for example, Quality Improvement plans (QIPs) which drive clinical effectiveness (HSE, 2009). During the evaluation phase of this project, it was found that accountability with regard to the ownership of training plans was not clearly defined. When this issue was addressed progress was made and training compliance rates improved.

The evaluation phase was used to extract and understand the baseline data associated with the three KPIs measured as part of the national hand hygiene audit process. A local hand hygiene audit was performed in order to assess the impact of updated education and training materials on national KPIs and comparison was made between local audit results and the historical baseline data. This comparison showed that some HCW cohorts had remained compliant, one cohort had improved while another had remained consistently low.

Chapter 5: Discussion and Conclusions.

5.1 Introduction:

HCAIs are a worldwide problem for healthcare providers (Pittet and Donaldson, 2006) and their surveillance and prevention must be a priority for healthcare institutions (WHO, 2009a). It is acknowledged that hand hygiene compliance is the most effective countermeasure in infection control and prevention (HPSC, 2005; WHO, 2009a, Gould, 2010). Both the HPSC (2005) and the WHO (2009a) advocates the provision of education and training in hand hygiene techniques and the establishment of an infrastructure to ensure the sustained adherence to best practice. The rationale for this project was initially driven by the need to meet the targets associated with the national auditing system. The hospital had been successful in previous national audits. The aim of this project was to improve hand hygiene education and training systems for all healthcare staff who interact with patients in a timely and continuous manner in order to effect better hand hygiene compliance among HCWs and by extension, to maintain and improve on our KPI scores in future national audit campaigns.

5.2 Discussion:

This aim of improved hand hygiene compliance was to be achieved by initially reviewing the relevant literature to identify lessons learned and barriers to implementation from previous interventions. Secondly, a review of the current mechanisms within the hospital regarding the delivery of hand hygiene education and training was undertaken to understand any possible

short-comings in this area. Thirdly, further insights into the current reality and associated barriers were solicited through a number of evaluation tools (surveys) circulated to staff and designed to understand the local cultural and behavioural influences with regard to hand hygiene.

A number of objectives were defined to support the achievement of the stated aim of the project. These objectives were aligned with the education and training components of the WHO Multimodal Hand Hygiene Improvement Strategy (WHO, 2009a) and included (i) a need to identify and understand historical and current barriers to hand hygiene compliance using a literature review (historical) and perception-based surveys (current), (ii) by gathering baseline data to understand recent performance relative to national targets and to identify any departmental anomalies, (iii) by updating and re-communicating educational and training materials based on new information and lessons learned and by (iv) assessing the impact of this education and training on the day to day work behaviours of HCWs through direct observation hand hygiene audits.

5.3 Findings:

Literature Review findings:

An understanding of historical improvements to effect improved hand hygiene compliance and barriers to implementation was gathered from a literature review of previous, relevant material using the RCSI on-line library. In the first instance, it was found that compelling evidence exists to support the rationale for this project given the reports on the existence of HCAIs, associated

risks to patients and staff, the human and financial costs associated with HCAIs and successful countermeasures to control these infections (Biddle, 2009; WHO, 2009a; WHO 2009b; Mortell, 2012). The literature also supports the theory that the application of good hand hygiene practices can prevent the spread of HCAIs (HIQA, 2009; WHO, 2009a; Gould, 2010; Wyeth, 2013; Aziz, 2014). Secondly, the literature review assisted in identifying a number of themes aligned to the reasons for the lack of compliance with hand hygiene procedures. A lack of knowledge (Tavolacci *et al.*, 2006), poor education and training (WHO, 2009a), poor communications (Barrow *et al.,* 2008), socialisation and an absence of role-modelling (Lusardi, 2007; Barrett and Randle, 2008), a lack of resources (Gould, 2010; Mortell, 2012), insufficient time (Boyce, 1999) and skin irritation (Pittet *et al.,* 2000; Wyeth, 2013) are all cited in the literature as being barriers to good hand hygiene compliance, however, the culture, attitudes, behaviours, perceptions and beliefs of HCWs are also emphasised in the literature as key underlying factors in non-compliance (Boyce, 1999; Kampf *et al.,* 2009; Wyeth, 2013). Thirdly, the literature review also assisted in identifying a number of countermeasures that had been applied in previous projects to enhance hand hygiene compliance. It was found that improved educational and training materials and promotional materials had produced positive results (Kampf *et al.*, 2009; Eveillard *et al.*, 2011). However, many commentators argue that improvements can only be sustained when the education and training is *on-going* and *repeated* (Whitby *et al.*, 2007; Kampf *et al.,* 2009; Eveillard *et al.,* 2011). Behavioural issues identified in the literature review can be addressed by informing HCWs of the threat to themselves (Erasmus *et al.,* 2009), by increased role-modelling (Hunt *et al.,* 2005), by increased accountability (Maxfield and Dull, 2011), through management prioritisation (Boyce, 1999) and through benchmarking and auditing (Wyeth, 2013).

In order to address the issues around "lack of knowledge" and "poor education and training" (Tavolacci *et al.,* 2006; WHO, 2009a) the hospital's education and training material was updated to reflect the latest knowledge and resources available to our hospital, for example, the inclusion of the personal threat that HCAIs present not only to the patient but also to the HCW, leveraging the finding that HCWs are motivated by self-protection (Erasmus *et al.,* 2009). Additional information with regard to the chemical properties of alcohol based hand-rub (Medical Safety Data sheets) used in our hospital was added to the educational material in an effort to convince HCWs that the use of hand-rub would not impact negatively on the condition of their own skin (Pittet *et al.,* 2000). Specific material was added to show that hand-rubbing was not an onerous task (Boyce, 1999) and that it was in fact less time-consuming that hand-washing (WHO, 2009a).

In order to make the education more meaningful, feedback was provided in the form of the hospital scores and areas for development from the HPSC website as studies on HCWs have shown that valid, research-based information and knowledge about hand hygiene do influence good practices (Eveillard *et al.,* 2011). In attempting to address the issues of "socialisation" and "lack of role-modelling", an expectation was set for all HCWs following their education and training that they should be role models for good hand hygiene practice once they returned to their departments in an effort to leverage their positive influence on others.

In parallel, in my capacity as hospital services manager, I was in a position to influence the introduction of additional upgraded hand-rub stations which incorporated new updated hand-rub

technique signage to improve our communications in relation to hand hygiene technique, hence addressing the "poor communications" threat identified by Barrow *et al.* (2008) and the "lack of resources as described by Mortell (2012). These additional hand rub stations have been strategically positioned at all ward/ patient room entrances/exits to facilitate the implementation of Maxfield and Dull's three core behavioural changes (Maxfield and Dull, 2011(See Table 1)). This intervention was agreed at zero financial impact to the institution with our supplier.

Pilot hand hygiene education and training class findings:

A training session was delivered to a subset of staff using the updated education and training materials and the feedback garnered from this session was positive. However some concerns were raised as a result of participant feedback. I found that concerns were raised which included the hand hygiene compliance rates of medical staff. These concerns were later supported with a data review of medical staff training compliance and the Period 8 national hand hygiene results for the medical staff cohort and in the local audit carried out in January 2015.

January 2015 hand hygiene education and training class findings:

At the January 2015 session, pre and post education, knowledge surveys were circulated. It was found that 10% of attendees had not previously received hand hygiene education and training despite the mandatory nature of this training. The education assessments themselves pointed to a modest improvement in knowledge. The finding that 10% of attendees had not previously received mandatory training was a serious concern for the team requiring further investigation given that all employees are obliged to attend such training at induction and once every two

years thereafter. It was also found that the pre training assessment responses showed that 17% of participants did not routinely use hand-rub. Given that the use of hand-rub is considered the gold standard for hand hygiene protection; this finding would drive a more comprehensive investigation into the reasons behind the non-use of hand-rub. It was later found that hand-rub consumption had dropped by 20% in Quarter 4, 2014 when compared to Quarter 3 2014, while the number of bed days used (BDUs) had increased by 9% in the same timeframe.

Knowledge and Perception Survey findings:

A second (knowledge and perception) survey was circulated to a subset (10%) of employees in order to assess the attitudes and perceptions of HCWs with regard to hand hygiene. I found that 8% of staff had not received the mandatory training in the previous two years and that 6% did not routinely use alcohol-based hand-rub. These responses added weight to the findings and concerns raised in the previous survey undertaken as part of the first updated education and training session in January 2015. Other findings show that 94% of participants agreed that hand hygiene was high priority in their department yet only 77% agreed that their managers attached a high level of importance to hand hygiene while only 69% replied that their colleagues attached importance to hand hygiene. Further, the average self-assessed hand hygiene compliance rate was measured at 94% whereas the average departmental compliance rate was perceived to be 91%. This data is contradictory however, the perceived rate did align with the most recent national hand hygiene audit score (90%) and the local audit (90%) and hence gives rise to a concern for the next national audit.

Behavioural Findings:

A review of perception responses showed that participants (> 90%) indicated that training, the availability of hand-rub and role modelling would enhance their hand hygiene compliance to a greater extent. This information will form the basis of further work required to enhance hand hygiene compliance.

Historical Audit findings:

Having gathered baseline data relating to the three KPIs associated with the national hand hygiene audits it was found that the training compliance rate was less than the national target of 100%, that the hand hygiene compliance rate was 90% compared to a target of 90% and that the hand-rub consumption rate was less than the goal of 25l/1000 BDUs. With regard to the education and training compliance rate (target 100%) it was found that the hospital was below target and that the education and training compliance tracking system was ineffective. A significant gap identified, is the lack of a centralised, electronic hand hygiene training attendance database which inhibits the hospital's ability to target staff that require training and hence improve on the hand hygiene training compliance KPI. It was later shown that the training compliance rate at the start of the project was 73% and that at time of submission, this had improved to 83%.

Another significant finding was that almost as many people found hand hygiene to be a time consuming effort as did others who found it to be of no significant effort. More emphasis would be needed in the educational materials to dispel this belief. Some staff may need re-assurance that it is acceptable to take this time rather than sacrifice safety and quality for outputs and they should be reminded that the recommended time for correct hand-rubbing procedure is a minimum of 20 seconds. Based on the data and information gathered from the local audit, I concluded that staff educated and trained in hand hygiene procedures were applying their knowledge. However, the application was not consistent across the hospital areas and while the hospital achieved a passing rate (90%) against the national hand hygiene targets, it was a borderline pass and this was a major concern for the implementation committee and for senior hospital managers.

5.4 Describing the experience of introducing change:

In introducing this change, I found that some elements of the change were particularly demanding and that others were more straight-forward. However, I can say that all elements of the change were easier to visualise as a result of applying a change model. In order to guide the direction and management of the project, I applied the HSE change model (HSE, 2008) which I found to be systematic and logical. Project management and leadership theories, studied in year one of my MSc were applied to good effect in helping me to understand my role and in gaining support for this project throughout the hospital by using my own clinical expertise in the area of infection prevention and control. This allowed me to employ expert power allied to my positional and legitimate power as a senior hospital manager.

The HSE change model (HSE, 2008) was used in order to assist me as the change agent in my project implementation role by providing a structure for project implementation, planning and execution as advocated in the O.D. literature (Kelly, 2011). Understanding the culture of the organisation (Lucas, 2010) and the power bases within, allowed me to foresee and address issues that might arise before they became roadblocks on the road to implementation. Unlike many other change models, he HSE model (HSE, 2008) assumes potential cultural impediments to change and puts forward a structured approach to change that focuses on communication and inclusion to foster a common approach for a successful outcome.

The tools described in the change model and the tools studied in previous modules assisted me greatly in progressing the project implementation plan. Described within, there are many associated tools available to the change agent (e.g., Strengths, Weaknesses, Opportunities and Threats (SWOT) Analysis and Force Field Analysis) which I employed in the project implementation plan. The model's initiation phase was used to develop a case for the change, informed by research and evaluation of the current status when compared to the desired status. One advantage of applying a change model to assist in change implementation is that the model can identify the possibility that individuals effected by a proposed change are unaware that a problem exists or of a need for change (Young, 2009).

As part of the preparation, key leverage points for success (strengths and opportunities) and the identification of barriers (weaknesses and threats) to the successful implementation of the project were identified through the use of the SWOT template. Key influencers in the process were identified by completing a stakeholder analysis while a force field analysis was completed to understand supporting and restraining forces towards the planned change. This work augmented my understanding of leadership and power bases and identified the people that I would need to influence in order to implement the change. Power bases identified by using a power taxonomy would help me to understand the positive and negative sources of power that could de-rail the process. While my preferred style is that of transformational leadership, I did find that sometimes, transactional leadership had to be applied especially when conflicting opinions developed when data was being reviewed.

One source of respite throughout the project was the fact that pre-existing teams agreed to adopt this project onto their roadmaps and to support the project from the outset. The infection prevention and control team had an obvious investment in the project while the Hospital Quality and Patient Safety committee would be an obvious and committed steering group. Finally, the Hygiene Services committee members were also identified as mechanisms for the continued implementation of the plan and their support was immediate. The early participation of these stakeholders was invaluable in creating and agreeing the case for the change and in implementing the planned change.

The planning phase of the HSE change model (HSE, 2008) was used to establish a roadmap of monthly interventions to build momentum towards the final goal of improved hand hygiene compliance in readiness for the May/June 2015 national hand hygiene audits. The preparation work completed in the initiation phase proved very beneficial in terms of agreeing the plan and getting the various stakeholders on board to execute the plan on time, despite the fact that it did include added work for some contributors. Having developed the implementation plan, implementation in itself was not relatively straightforward, this phase was more time consuming than was expected as many actions associated with the plan required daily follow-up while other actions required negotiation with external organisations such as chemical suppliers. My role in this phase was that of primary leadership and co-ordination of the multiple facets of the implementation plan.

Mainstreaming and sustaining the change into new ways of working and behaving was the most challenging aspect of the project. At this point the Kirkpatrick model (Kirkpatrick, 1994) was employed to measure and evaluate our training strategy. At times the findings of the knowledge and perception surveys were frustrating and disappointing, given the amount of work that I and others had invested in the project and given the time pressure associated with the impending national hand hygiene audit. However, as a leader, I realised that one should not display such emotions in the presence of the team and in fact the knowledge that I had gained through the literature review helped me to turn this frustration into an understanding of O.D. change. I was also aware that the measurement and evaluation approach in the Kirkpatrick model (Kirkpatrick, 1994) had provided new information to the project team and while improvements may have been modest, the data clearly indicated where we need to focus our energy in terms of continuous improvement.

By far the most important new learning for me is the ability to measure and evaluate data by employing the tools suggested in Kirkpatrick's model (Kirkpatrick, 1994). These measurement and evaluation skills and the ability to present data in graphical form allowed me as the change agent to understand whether the aim and objectives of the project were being achieved and if they were not, why they were not. While much of the measurement resulted in a sub-optimal evaluation results, it was nonetheless beneficial in determining that re-direction is required and that future work will be correctly identified rather than applying assumptions.

5.5 Recommendations for future work:

Based on the findings outlined in this chapter a number of recommendations will be presented to the implementation team for ratification. This work is a journey and I acknowledge that we are at the beginning of that journey. Many commentators have advocated a need for on-going and continued education and training and to that end I will recommend that mandatory training in this area should be annual rather than every two years. It is my opinion that the principles of hand hygiene compliance require more frequent opportunities to take time out to remember why we should adhere to good technique.

It is important to understand that compliance among HCWs can be low when guidelines are simply disseminated through an institution without the opportunity to seek clarification (Barrett and Randle, 2008) and for this reason I intend to propose to the committee that no HCW should ever leave the education and training session without scoring 100% on the post education

assessments. I also propose to add a 15 minute questions and answers session to allow for questions.

Having discovered a deficit in the education and training attendance tracking system I propose to work with our Information and Communication Technologies (ICT) specialist to develop an automated tracking system which will track training compliance and will be accessible to all managers to help them schedule future classes for their direct reports. In order to further enhance the levels of accountability, I intend to re-communicate to managers their roles and responsibilities with regard to hand hygiene training compliance. Their job description includes an obligation to provide staff with the education and training required to fulfil their role and an obligation to set time aside to facilitate that training. A specific intervention will need to be developed for medical staff who have been shown to consistently have sub-optimal compliance rates.

5.6 Conclusion:

In undertaking a literature review I was able to identify successful actions and barriers associated with hand hygiene compliance. In focusing on the attitudes of HCWs through survey feedback, I was able to identify and address some compliance issues. Through measurement and evaluation, a number of systematic issues such as education and training compliance, a lack of a tracking system and the sub-optimal compliance rates among medical staff were identified. The hospital has met its KPI targets for previous national audits and for the recent local audit, however, I fear that we may not pass the imminent national audit based on the systematic issues identified above.

Consequently, the hospital has renewed its multimodal hand hygiene strategy for 2015 to support the National Service Plan (HSE, 2014) with the continuation of the programme of themed monthly hand hygiene awareness initiatives. I acknowledge that this change is slow and somewhat challenging however, in reality this change process is only beginning as a result of the data collection, analysis and feedback garnered in this project.

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Appendix 1: Literature Review Summary Findings.

Author	Year	Setting	Type of Study	Themes/Conclusions	Critique/Comments	Pilot Application
Eveillard et al	2011	geriatric ward	before and after evaluation	Behavioural change is multifaceted but needs to be understood to improve hand hygiene compliance rates. Stakeholder involvement was neglected. Contextualised training is better than generic.	Limited to geriatric locations but advocates location specific training and the delivery of same by local experts.	Devise a pilot that includes localised training material and identify local experts to deliver the training and act as role models.
Wyeth	2013	Infection prevention and control nurse role	literature review	Delivery of training, audit, feedback are needed to define practical interventions. Role models should be part of any improvement plan. Examples from real life experiences from staff has a more pronounced impact on other staff. Multi-modal strategies are required to improve hand hygiene compliance.	Limited to one perspective (that of the IPCN).	In order to improve education and training delivery, I need to devise a mechanism to extract information from staff including perceptions of barriers. Include personal experiences if possible.
Aziz	2014	NHS	literature review	Article highlights how improving hand hygiene compliance can improve the level of healthcare associated infection. Barriers to hand hygiene compliance are outlined. The five moments of hand hygiene should be used as the standard for training in hand hygiene techniques.	This article brings together a number of papers on the benefits of hand hygiene compliance.	Use this paper to start planning for the barriers that will be identified in my own questinaire.
Mortell	2012	General	Observational	Focus should be applied to clinicians' moral and ethical obligations during training and orientation.	Author is unable to define why hand hygiene compliance rates remain low.	Interventions need to appeal to the moral obligations of employees and include a call for leaders to be role models with regard to hand hygiene compliance.
Randle et al	2012	NHS paediatric	Observational	Hand Hygiene is a cost effective approach to reducing the incidents of HCAIs.	There is an obvious opportunity identified in the paper for further work, ie, to focus on the role of family and visitors to enhance hand hygiene compliance. Limited to paedriatic setting.	Some attention must be given to the patient suroundings and possible cross contamination.
Allegranzi et al	2014	USA healthcare facilities	News Headline	This report refers to a national implementation plan in the USA and rates of annual mandatory training are reported. High rates of alcohol rub usage and compliance rate measurement are reported.	Very little in the way of detail. More numbers than facts.	Extract alcohol rub usage data for the pilot.
Alemagno et al	2010	on line learning	literature review	This report outlines the positive aspects of using on line learning methods to teach students about hand hygiene.	This paper refers only to on line training and also to self assessment which can be unreliable.	Not possible to incorporate on line learning at this time.
Kilpatrick et al	2012	Invasive devices	Peer review	Insertion of devices increases the risk of infection and therefore a heightened sense of urgency and attention to detail is required in order to protect patients and staff.	Paper applies to the area of invasive devices	Area of invasive devices could be an area of future work but will not be addressed in this project.
Aziz	2013	NHS wards; mental health	before and after evaluation	The increased availability of hand washing materials improves hand hygiene compliance rates.	The improvement may be short lived as the audits were not sustained.	Need to include these interventions in the multi-modal hand hygiene improvement plans.
Barrett and Randle	2008	Teaching/training hospital, UK	Qualitative and Interpretive study	Socialisation and role models shape hand compliance attitudes.	passive dissemination of information is largely uneffective.	Need to garner support from senior managers and incorporate ward leaders as role models.
Kampf et al	2009	German healthcare institution	Peer review	Outlines the connection between hand hygiene compliance and infection rates. Details the potential barriers to hand hygiene compliance.	Good information to impart in training material in that the data clearly supports the need for high hand hygiene compliance rates.	Data here can be used in training material
Oh et al	2012	Singapore Healthcare group	berfore and after evaluation	Training and availability of materials had a positive influence on hand hygiene compliance rates.	The audit was conducted over a short period of time.	Again, multi-modal approach is successful in the short term.
Roberto et al	2012	Medical students in Portugal	Behavioural study	How medical students view hand hygiene compliance is largely shaped by the actions of their role models.	Limited to students but given an insight into socialisation aspects of compliance.	Pay attention to the role of role models in making a change to compliance rates.
Srigley et al	2014	Canadian acute hospital	berfore and after evaluation	Increases in hand hygiene compliance rates were observed when auditors were visible on the floor.	The Hawthorne effect was examined.	Need to incorporate the fact that the Hawthorne effect may have a false elevated rate of hand hygiene compliance.
Clayton	2014	New Hampshire Nursing News	News Bulletin	This report outlines a brief history of hand hygiene but more importantly outlines a number of tools that can aid in the effort to delivery better hand hygiene education, training and compliance rates.	Visual aids are outlined such as screensavers, bulletins, articles, education carts. Physical aids like glow boxes and glitterbug handrub also referenced.	Lots of good ideas here for my own project and how to communicate the hand hygiene message.
Gould	2010	Hand Hygeien audit in the NHS (UK).	Literature research	Auditing of hand hygiene procedures does improve compliance rates but there is also evidence to support the observation that some interventions do not result in any improvement at all.	Author underlines the need to plan and execute hand hygiene audits in a detailed manner so that data will be reliable.	Feedback is again identified as a means to engage staff in the audit process.
Biddle	2009	AANA	AANA Journal Course	Recommendations include the use of portable dispnsers, visual reminders, rewards systems. Some evidence to suggest that compliance is motivated by a threat to the employee, moreso than to the patient.	High on theory ,low on practial applcation.	Need to leverage the idea that staff are motivated by a threat to their own safety.
Lusardi	2007	Nursing students clinicl placements	peer review	Paper includes costing of HCAIs. Paper refers to student behaviours being influenced by those around them.	Author notes that hand hygiene training programs are often directed at doctors and nurses.	Ensure that education and training is directed to all HCWs including attendents and allied professionals.
Chau	2011	Hong Kong Hospitals	Observational	Work experience had an influnce on the rate of compliance of healthcare workers. Tailored information and practical training as opposed to theoretical is advocated.	An inappropriate dependence on glove use is identified as a subsitute for hand hygiene compliance.	My training documentation needs to include an observation on and education regarding glove usage.
De Wandel et al	2010	ICUs in Belguim	Behavioural	Few interventions used in isolation have any long lasting effects - attitude and social influnce need to be considered as well.	This is based on self-reported compliance rates	Need to consider the conflict between lack of time and the time spent adhering to hand hygiene policies.
Ott and French	2009	Mental health setting in Canada	Literature review	Hand hygiene behaviours and attitudes are complex and need to be understood in order to influence institutional commitment. Normative beliefs need to be challenged using data based argument.	Focused on student nurses	Need to include questions in the questionaire that address the peronal reasons fo on compliance and design countermeasures to address.
Aiello et al	2008	Community	Literature review/Meta Analysis	Hand Hygiene compliance improvements have a direct and positve impact on gasterointestinal illness rates.	Community based only however, some good direction that can be applied to the hospital setting. Also advocates the need for microbiological assessment of illness agents.	The methods described here can be applied to many other settings including the hospital setting.
Barrow et al	2008	Communications dept. At Denver Health USA	berfore and after evaluation	This paper refers to a before, during and after evaluation of hand hygiene compliance rates follwing the roo out of a communications campagin that would last for three years.	Compliance rates did improve gradually over a number of years but only significant ground was achieved after a punitive regieme was put in place.	Sanctions do work, but as I am starting down the compliance improvement path, I need to bring the staff with me.
Maxfield and Dull	2011	Spectrum Health, Grand Rapids, USA	berfore and after evaluation	The healthcare provider partnered with a corporate training company to deliver a change management training module to improve hand hygiene compliance rates.	Both personal and social and professional motivations were assessed, addressed and highlighted in the training.	Barriers are identified (social and personal) and addressed in the training materials - this is something that I need to address in my own project.

Appendix 2: The Five Moments for Hand Hygiene (WHO, 2009b).

Appendix 3: Post Education Evaluation Survey

Evaluation of Education Session: **Date:**

Topic: **"Your Five Moments for Hand Hygiene".**

Question 1: Which healthcare worker category do you belong to?

Nurse ☐

Auxiliary ☐

Medical ☐

AHP/Other ☐

Question 2: Was this education session informative?

YES ☐

NO ☐

Question 3: Did this education give you a better understanding of the 5 moments for hand hygiene?

YES ☐

NO ☐

Question 4: Is there anything else that should be added to this educational session?

YES ☐

NO ☐

COMMENTS:

Appendix 4: Hand Hygiene Perception Survey.

Hand Hygiene/HCAI Perception Survey 2015.

This questionnaire is designed to understand hand hygiene/HCAI Attitudes and your hand hygiene education and training needs.
This is an anonymous and confidential questionnaire, so please feel free to answer the questions openly and directly! It should only take around 5 minutes to complete.

Thank you in advance for your help.

Date Completed: _____
Speciality (e.g., Nurse, Doctor, HCA etc.): _____
Age (years):_____ Gender (please tick one): M □ F□

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1. Did you receive formal training in hand hygiene in the last two year? Yes ☐ No ☐

2. Do you routinely use an alcohol-based hand-rub for hand hygiene? Yes ☐ No ☐

3. In your opinion, what is the average percentage of hospitalised patients who will develop a health care-associated infection (between 0 and 100%)? ____ % ☐ I don't know

4 .In general, what is the impact of a health care-associated infection on a patient's clinical outcome?

☐ Very low ☐ ☐ High ☐ Very high

5. What is the effectiveness of hand hygiene in preventing health care-associated infection?

☐ Very low ☐ Low ☐ High ☐ Very high

6. Among all patient safety issues, how important is hand hygiene in your department?

☐ Low priority ☐ Moderate priority ☐ High priority ☐ Very high priority

7. On average, in what percentage of situations requiring hand hygiene do <u>health-care workers</u> in your department actually perform hand hygiene, either by hand-rubbing or hand-washing (between 0 and 100%)?

_____% ☐ I don't know

8. In your opinion, how effective would the following actions be to improve hand hygiene permanently in your institution?

Please tick one "☐" on the scale according to your opinion.

a. Managers support and openly promote hand hygiene.

Not effective ☐---☐---☐---☐---☐---☐---☐ Very effective

b. Alcohol-based hand-rub is always available at each point of care.

Not effective ☐---☐---☐---☐---☐---☐---☐ Very effective

c. Hand hygiene posters are displayed at point of care as reminders.

Not effective ☐---☐---☐---☐---☐---☐---☐ Very effective

d. Each health-care worker receives education on hand hygiene.

Not effective ☐---☐---☐---☐---☐---☐---☐ Very effective

e. Clear and simple instructions for hand hygiene are made visible for every health-care worker.

Not effective ☐---☐---☐---☐---☐---☐---☐ Very effective

f. Health-care workers regularly receive feedback on their hand hygiene performance.

Not effective ☐---☐---☐---☐---☐---☐---☐ Very effective

g. You always perform hand hygiene as recommended (being a good example for your colleagues).

Not effective ☐---☐---☐---☐---☐---☐---☐ Very effective

h. Patients are invited to remind health-care workers to perform hand hygiene.

Not effective ☐---☐---☐---☐---☐---☐---☐ Very effective

9. What importance does your line manager attach to the fact that you perform optimal hand hygiene?

No importance ☐---☐---☐---☐---☐---☐---☐ Very high importance

10. What importance do your colleagues attach to the fact that you perform optimal hand hygiene?

No importance ☐---☐---☐---☐---☐---☐---☐ Very high importance

11. What importance do patients attach to the fact that you perform optimal hand hygiene?

No importance ☐---☐---☐---☐---☐---☐---☐ Very high importance

12. How do you consider the effort required by you to perform good hand hygiene when caring for patients?

No effort ☐---☐---☐---☐---☐---☐---☐ A big effort

13. On average, in what percentage of situations requiring hand hygiene do <u>you</u> actually perform hand hygiene, either by hand-rubbing or hand-washing (between 0 and 100%)?

☐ %

Please comment on aspects of your work environment which you would see as being barriers to good hand hygiene compliance:

What barriers exist in your work area that impact on your/others ability to comply with hand hygiene policies? (e.g., hardware, resources, facilities, buildings, supplies, documentation, behaviours)

Comments:

Please comment on how your area could be improved or on how other groups could support your work area to improve hand hygiene compliance rates:

Comments:

Thank you very much for your time!

Appendix 5: Pre Training Questionnaire.

Hand Hygiene/HCAI Knowledge, Attitudes and Safety Questionnaire

This questionnaire is designed to understand hand hygiene/HCAI knowledge & attitudes and your hand hygiene education and training needs.
This is an anonymous and confidential questionnaire, so please feel free to answer the questions openly and directly! It should only take around 5 minutes to complete.

Thank you in advance for your help.

Date Completed: _____
Speciality (e.g., Nurse, Doctor, HCA etc.): _____
Age (years):_____ Gender (please tick one): M □ F □

PRE- TRAINING Questionnaire:

1. Did you receive formal training in hand hygiene in the last two year? **Yes** ☐ **No** ☐

2. Do you routinely use an alcohol-based hand-rub for hand hygiene? **Yes** ☐ **No** ☐

3. Which of the following is the main route of cross-transmission of potentially harmful germs between patients? (*Tick one answer only*)

☐ Health-care workers' hands when not clean

☐ Air circulating in the hospital

☐ Patients' exposure to colonised surfaces (i.e., beds, chairs, tables, floors)

☐ Sharing non-invasive objects (i.e., stethoscopes, pressure cuffs, etc.) between patients

4. Which of the following hand hygiene actions prevents transmission of germs *to the patient*?

a) Before touching a patient ☐ Yes ☐ No

b) Immediately after a risk of body fluid exposure ☐ Yes ☐ No

c) After exposure to the immediate surroundings of a patient ☐ Yes ☐ No

d) Immediately before a clean/aseptic procedure ☐ Yes ☐ No

5. Which of the following hand hygiene actions prevents transmission of germs *to the health-care worker*?

a) After touching a patient ☐ Yes ☐ No

b) Immediately after a risk of body fluid exposure ☐ Yes ☐ No

c) Immediately before a clean/aseptic procedure ☐ Yes ☐ No

d) After exposure to the immediate surroundings of a patient ☐ Yes ☐ No

6. Which of the following statements on alcohol-based hand-rub and hand-washing with soap and water are true?

a) Hand-rubbing is more rapid for hand-cleansing than hand-washing ☐ True ☐ False

b) Hand-rubbing causes skin dryness more than hand-washing ☐ True ☐ False

c) Hand-rubbing is more effective against germs than hand-washing ☐ True ☐ False

d) Hand-washing and hand-rubbing are recommended to be performed in sequence

☐ True ☐ False

7. What is the minimal time needed for alcohol-based hand-rub to kill most germs on your hands? *(Tick one answer only)*

a) ☐ 20 seconds
b) ☐ 3 seconds
c) ☐ 1 minute
d) ☐ 10 seconds

8. Which of the following should be avoided, as associated with increased likelihood of colonisation of hands with harmful germs?

a) Wearing jewellery ☐ Yes ☐ No

b) Damaged skin ☐ Yes ☐ No

c) Artificial fingernails ☐ Yes ☐ No

d) Regular use of a hand cream ☐ Yes ☐ No

Thank you very much for your time!

Appendix 6: Post Training Questionnaire.

Hand Hygiene/HCAI Knowledge, Attitudes and Safety Questionnaire

This questionnaire is designed to understand hand hygiene/HCAI knowledge & attitudes and your hand hygiene education and training needs.
This is an anonymous and confidential questionnaire, so please feel free to answer the questions openly and directly! It should only take around 5 minutes to complete.

Thank you in advance for your help.

Date Completed: _____ Your Speciality (e.g., Nurse, Doctor, HCA etc.): -
_____
Age (years):_____ Gender (please tick one): M □ F □

POST- TRAINING Questionnaire:

1. Did you receive formal training in hand hygiene in the last two years? **Yes** ☐ **No** ☐

2. Do you routinely use an alcohol-based hand-rub for hand hygiene? **Yes** ☐ **No** ☐

3. What is the minimal time needed for alcohol-based hand-rub to kill most germs on your hands? ***(Tick one answer only)***

a) ☐ 20 seconds
b) ☐ 3 seconds
c) ☐ 1 minute
d) ☐ 10 seconds

4. Which of the following should be avoided, as associated with increased likelihood of colonisation of hands with harmful germs?

a) Wearing jewellery ☐ Yes ☐ No

b) Damaged skin ☐ Yes ☐ No

c) Artificial fingernails ☐ Yes ☐ No

d) Regular use of a hand cream ☐ Yes ☐ No

5. Which of the following statements on alcohol-based hand-rub and hand-washing with soap and water are true?

a) Hand-rubbing is more rapid for hand cleansing than hand-washing ☐ True ☐ False

b) Hand-rubbing causes skin dryness more than hand-washing ☐ True ☐ False

c) Hand-rubbing is more effective against germs than hand-washing ☐ True ☐ False

d) Hand-washing and hand-rubbing are recommended to be performed in sequence ☐ True ☐ False

6. Which of the following is the main route of cross-transmission of potentially harmful germs between patients? (*Tick one answer only*)

☐ Health-care workers' hands when not clean

☐ Air circulating in the hospital

☐ Patients' exposure to colonised surfaces (i.e., beds, chairs, tables, floors)

☐ Sharing non-invasive objects (i.e., stethoscopes, pressure cuffs, etc.) between patients

7. Which of the following hand hygiene actions prevents transmission of germs *to the patient*?

a)	Before touching a patient	☐ Yes	☐ No
b)	Immediately after a risk of body fluid exposure	☐ Yes	☐ No
c)	After exposure to the immediate surroundings of a patient	☐ Yes	☐ No
d)	Immediately before a clean/aseptic procedure	☐ Yes	☐ No

8. Which of the following hand hygiene actions prevents transmission of germs *to the health-care worker*?

a)	After touching a patient	☐ Yes	☐ No
b)	Immediately after a risk of body fluid exposure	☐ Yes	☐ No
c)	Immediately before a clean/aseptic procedure	☐ Yes	☐ No
d)	After exposure to the immediate surroundings of a patient	☐ Yes	☐ No

Thank you very much for your time!

Appendix 7: Change Implementation Project Gantt Chart.

#	TASKS	Owner(s)	Status	Sep-14	Oct-14	Nov-14	Dec-14	Jan-15	Feb-15	Mar-15	Apr-15	May-15
1	Project Planning											
1.1	Brainstorming to decide on project title and scope	#07208782	Complete									
1.2	Seek support from key stakeholders	#07208782	Complete									
1.3	Seek approval from Hospital Management team to proceed	#07208782	Complete									
1.4	Inform all effected depts and staff of the project (outline)	#07208782	Complete									
1.5	Form a project management team with members from effected job roles	#07208782	Complete									
1.6	Establish and formulate the logistics associated with the project team	#07208782	Complete									
1.7	Decide roles and responsibilities for the team	#07208782	Complete									
2	Project team alignment											
2.1	Assemble team with intro to project title, imperatives etc as per dissertation submission	#07208782	Complete									
2.2	Understand the current reality by gathering current performance data	#07208782	Complete									
2.3	Understand and define the goals using HSE targets as the ultimate goal	#07208782	Complete									
2.4	Define intermediate and long term goals	#07208782	Complete									
2.5	Develop a project roadmap	Team	Complete									
3	Action plan											
3.1	Standardise hospital procedures relating to Hand Hygiene	Team	Complete									
3.2	Update training materials based on Literature review	IP&C										
3.3	Develop evaluation Survey	#07208782										
3.4	Plan delivery of pilot class	IP&C										
3.5	Collect monthly hand hygiene and training statistics by discipline	#07208782										
3.6	Monthly feedback progress report to SMOG	#07208782										
4	Educate											
4.1	Deliver 1st class with updated materials	IP&C										
4.2	Evaluate 1st class	#07208782										
4.3	Develop a pre and post knowledge assessment (WHO toolkit)	#07208782										
4.4	Devlop staff knowledge and perception surveys (WHO toolkit)	#07208782										
5	Project implementation											
5.1	Deliver a pre and post knowledge assessment	IP&C										
5.2	All further classes delivered with updated training materials	IP&C										
5.3	Initiate monthly hand hygiene improvement promotion initiatives	Team										
5.4	Local hand hygiene compliance Audits	#07208782										
5.5	Gather all data from all surveys and evaluate responses	#07208782										
5.6	Develop and deliver a staff perception survey (WHO toolkit)	#07208782										
6	Final Evaluation											
6.1	Collate all knowledge, perception survey data to identify gaps	#07208782										
6.2	Analysis of local audit and performance vs national targets	Team										
7	Continuous Improvement Road Map											
7.1	Presentation of findings to Senior Management (proposed future work)	#07208782										
7.2	Agreement on Continuous Improvement Road Map (proposed future work)	Team										
7.3	Implementation plan agreed (proposed future work)	Team										
8	Continuous Improvement Road Map											
8.1	FINAL write up and submission to RCSI	#07208782										

Appendix 8: Poster.

RCSI INSTITUTE OF LEADERSHIP

Hand Hygiene Education and Training Improvement Strategy in an Acute Hospital setting.
MSc in Healthcare Management.
Student Number : 07208782

RCSI DEVELOPING HEALTHCARE LEADERS WHO MAKE A DIFFERENCE WORLDWIDE

Abstract

The **aim** of this organisational development (O.D.) project was to improve Hand Hygiene education and training compliance in an acute Hospital setting and by extension, improve hand hygiene compliance.

Rationale: Hand Hygiene is identified as the single most important intervention in reducing the transmission of Healthcare associated infections (HCAIs).

In 2009, the WHO published comprehensive evidence-based guidelines on Hand Hygiene in healthcare, which introduced a standardised approach to Hand Hygiene practices; 'The Five Moments for Hand Hygiene'. These guidelines have been adopted and are core to our education and training programme.

Methodology: The Health Service Executive (HSE) Change model was used to guide this O.D project.

Evaluation: Kirkpatrick's model was employed to evaluate the Hand Hygiene education and training. A pilot class completed a pre and post education, knowledge survey. It was found that 10% of attendees had not previously received hand hygiene education and training despite it being mandated. The post education assessments pointed to a modest improvement in knowledge. Pre training assessment responses showed that 17% of participants did not routinely use hand-rub. A second (knowledge and perception) survey was circulated to a stratified purposeful cohort (10%) of employees in order to assess the attitudes and perceptions of Healthcare Workers (HCWs) with regard to hand hygiene. It was found that 8% of staff had not received mandatory training and 6% did not routinely use alcohol-based hand-rub.

Results and Conclusion: Results show that the education and training compliance rate at the start of the project in September 2014 was 73% and this had improved to 83% by April 2015, following the education programme .The hand hygiene compliance rate was unchanged. Continued re-enforcement of this quality and patient safety indicator will remain a key deliverable for each manager through 2015.

Hand Hygiene Education and Training Improvement Strategy in an Acute Hospital setting.

RCSI INSTITUTE OF LEADERSHIP

MSc in Healthcare Management.

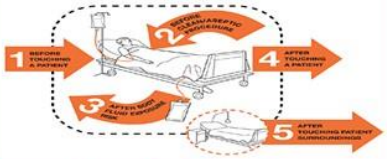
Student Number : 07208782

RCSI DEVELOPING HEALTHCARE LEADERS WHO MAKE A DIFFERENCE WORLDWIDE

Introduction & Background

Healthcare associated infections(HCAIs) describe those infections which are contracted by patients during a hospital stay or which develop among hospital staff. HCAIs are a major problem with regard to patient safety and its surveillance and prevention must be a priority for institutions committed to making healthcare safer. The impacts of HCAIs include prolonged hospital stays, long term disability, financial burden and fatalities[1]. European studies report HCAI rates of 4.6% to 9.3% [1].Specific to Ireland ,HCAI prevalence has been measured at 5.2%[2]. It is estimated that 25,000 patients contract a HCAI each year which has an associated cost of €11.8M[3]. However, while it is acknowledged that not all HCAIs are preventable, it is estimated that hand hygiene compliance among healthcare workers (HCW) could prevent an estimated 50% of HCAIs. Although education alone is insufficient to effect sustained changes in practice,it remains an essential component of all Hand Hygiene programmes [1].

Figure 1: Five Moments for Hand Hygiene[1]



Aims & Objectives

The **aim** of this project is to improve hand hygiene education and training systems for all healthcare staff who interact with patients in order to effect improved HH compliance.

The **objectives**:

- Determine baseline of hand hygiene education and training compliance rates.
- 100% of all staff who interact with patients have received Hand Hygiene education and training.
- Conduct direct observation Hand Hygiene audits.

Methodology

The HSE change model was employed as the framework for this project.

Figure 2: HSE Change Model [4]

Initiation:

- Identification of barriers to effective implementation of hand Hygiene education attendance.
- Enhancement of the Hospital Quality and Patient Safety culture.
- A SWOT, Stakeholder analysis and Force Field analysis was undertaken.

Planning:

- Leadership, management and governance defined.
- Hospital Committees communication plan devised.
- Implementation plan devised for the Infection Prevention and Control team.

Implementation:

- All department/ ward managers tasked with responsibility to drive Hand Hygiene education and training attendance.
- Hand Hygiene training staff attendance records validated.
- Roll out of enhanced Hand Hygiene education by Infection Prevention & Control staff.

Mainstreaming:

- Hospital Quality and Patient Safety culture in relation to mandatory two-yearly Hand Hygiene education and training for all staff who interact with patients.
- Defined ownership for staff attendance at education.

References

[1]Switzerland. World Health Organisation (WHO) Guidelines on Hand Hygiene in Healthcare (2009a) *First Global Patient Safety Challenge Clean Care is Safer Care'*. Geneva: WHO
[2]Ireland. Health Service Executive-Health Protection Surveillance Centre (2012) *'Report on Hand Hygiene Compliance in Acute Hospitals'*, Dublin: Stationery Office. [3]Ireland. Health Service Executive (2011) *'Annual Report and Financial Statements'*, Dublin: Stationery Office. [4]Ireland. Health Service Executive (2008) *'IMPROVING OUR SERVICES: A Users' Guide to Managing Change in the Health Service Executive'* Dublin: Stationery Office.

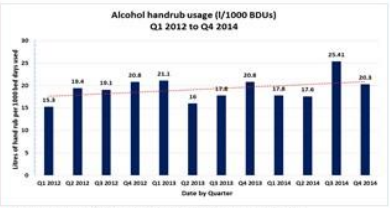
Evaluation

Kirkpatrick's model was used to evaluate the education and training.

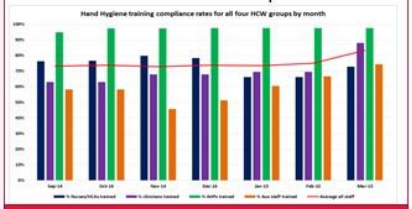
Reaction: Post education Evaluation surveys conducted.

Learning: Pre and Post Knowledge assessment and perception survey conducted.

Behaviour: Direct Hand Hygiene audits and measurement of Alcohol Hand Rub usage completed.



Results: Overall 10% increase in Education attendance compliance.



Organisational Impact

To effect organisational change strong Leadership is Key to define and drive the need for change. A Quality and Patient Safety culture is the critical component to change employee behaviour. Communication is vital and hospital committees were used as the communication strategy. Continued re-enforcement of staff attendance at hand Hygiene education is a requisite among all managers.

Conclusion

It is acknowledged that Hand Hygiene practices reduce HCAIs, yet HCW compliance with best practice remains suboptimal. Education is key to Hand Hygiene compliance however behavioural and cultural changes are complex challenges which can impact on the benefits of education.